

FLIGHT

The
AIRCRAFT ENGINEER
AND AIRSHIPS

First AERONAUTICAL
WEEKLY IN THE
WORLD

Founded in 1909 by Stanley Spooner

DEVOTED TO THE INTERESTS,
PRACTICE AND PROGRESS
OF AVIATION

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Air Service Development

A GAIN the London Chamber of Commerce has been active. It has laid before the Government a scheme for arriving at a definite policy in guiding the development of air services in the United Kingdom. The Chamber suggests that a new statutory body should be formed, on which the Air Ministry, the G.P.O., aircraft operators, insurance and commercial interests should be represented, and that this body should stand to commercial air transport in much the same relation as does Trinity House to shipping. This body should receive money from the Government for equipping and maintaining wireless, lighting, meteorological information, and traffic control services on the air routes, and should collect the dues. It should also at once begin to plan out the principal present and future air routes in this country, and should advise municipalities as to the type of aerodrome which they would do well to prepare. The wording of the Chamber's memorandum is even stronger, for it says: "The publication of this plan, or part of it, would give to those bodies, particularly in this country, which hesitate to establish aerodromes the needful assurance that a particular type of aerodrome to serve their locality would form part of a definite scheme."

The justification given for this scheme of the London Chamber of Commerce would seem to be that hitherto the development of inland air routes has been "haphazard," and that local bodies do not know where they stand in the matter of providing aerodromes. We may agree to some extent that the development of inland airways has so far been haphazard, by which we understand that various private parties have thought that profit might be made out of such and such a route, and they have not always been right. We agree also that sympathy is due to what must be the bewildered state of mind of some local bodies who have no clear idea whether, if they do set up an aerodrome, they will have

wasted the ratepayers' money or, if they do not do so, they will have missed a profitable investment. They must find it very hard to obtain disinterested and yet expert advice.

These reasons are hardly adequate for the setting up of a new statutory body. Because the principle has been accepted of having a special body to deal with airworthiness, we do not want analogous bodies to deal with every aspect of air transport. Haphazard development may have its drawbacks. It does not increase the popular confidence in flying if mushroom companies spring up and after a season wither away. This, however, is probably a minor drawback. Our national shipping industry and our other great commercial industries have sprung up from private enterprise, and in their early days some pioneers have fallen by the way. It is the British way. A statutory body to guide our air transport pioneers into one groove smacks too much of Socialism to commend itself readily to the British public. Individual enterprise is what we favour, and from it a mass of experience is being built up out of which we hope that in due course a thriving industry will emerge. A short cut to success may be taken by using the experience of traffic already acquired by railways, by road transport companies, and by Imperial Airways. Their co-operation is all to the good, provided only that they do not shut out the private adventurer who may prove to be a genius and make good without extraneous help. There is no indication that such will be the case.

As for advising the local bodies about aerodromes, we are all agreed that we do not want to see a repetition of the Barton Moss fiasco. Yet it does not seem that this would certainly have been avoided even if the proposed statutory body had been in existence at the time. No one doubts that Manchester ought to have a municipal aerodrome, and the Manchester Corporation did not act without advice in choosing Barton Moss. As for smaller towns and even cities, we doubt very much if any body could say with certainty that any one of them ought to

have a first-class or a second-class aerodrome. The proposed body might draw up a plan, and then could give an assurance that a certain town was on that plan, but what would that assurance be worth? Natural development might easily falsify the hopes raised by that plan, and we believe that it is to natural development that we must look if ever our inland airways are to be a success.

That more ground facilities in the way of wireless and meteorological information are badly needed we agree; but that does not prove the need of a new body to provide and administer them. Special funds at the disposal of the Civil Aviation Directorate of the Air Ministry could accomplish all that is needed without the complication of new machinery and consequent new expense. The attitude of the London Chamber of Commerce seems to be, "Any plan is better than no plan. Here is one."

A City of London Monster

THE Loch Ness Monster has kept us interested most of the summer, but with the departure of the guns for the moors we must expect the giant gooseberry and the central London aerodrome once more to raise their heads. We have not been disappointed; a news agency has informed us that the City of London is busy with schemes for erecting an aerodrome in the neighbourhood of London Bridge which is to be 200 feet high and is to cost some £5,000,000. So shall most of the 40 minutes road journey from Croydon to London be saved.

Everyone agrees that this 40 minutes on the road is too high a proportion of the travel time of an air journey; but is the central elevated aerodrome the best solution? Before long we shall see 50-seater and 100-seater aeroplanes constantly coming in to the London aerodrome (wherever it may be) with all seats filled.

Are these monsters to land on the central London structure, or are they to come down at Croydon, or elsewhere, and send their passengers in by autogiro? Or, as a third possibility, are all passenger aircraft to have rotating wings? We cannot visualise the large fixed-wing aeroplanes of the near future landing on the structure, and, if all the passengers have to be transferred to autogiros, we may well wonder how much of that 40 minutes is actually going to be saved, and at what cost. We wonder also what is to happen in fog. Even with the best conceivable devices, groping one's way among the chimneys of London and landing on a sort of roof which must allow far less margin of error than is allowed at Croydon is hardly an attractive prospect.

When we are invited to look ahead, as this scheme does invite us, we wonder whether the solution of the problem may not be found in an amphibian autogiro. It has been decided that the landing of ordinary seaplanes on the Thames would cause undue interference with river traffic; but the capabilities of an amphibian autogiro might perhaps lead to a reconsideration of that suggestion. Such aircraft would certainly not ask for much water room when landing, though they might require rather more when taking off before they "unstuck." The idea is at the least attractive, and we think that the fathers of the City of London would do well to indulge in a little speculation as to the future before they launched into a five million pound scheme of the nature discussed above.

Taking the suggestion a little more seriously, there are probably no insuperable technical difficulties, but in hard £ s. d. what would the landing fees have to be in order to pay the interest on the capital outlay? There will obviously be a limit on the number of aircraft which can be landed and taken off in a given period of time, and the revenue will have to come partly from that source.



THE FIGHTING "PTERODACTYL": Probably never before has a military type of aeroplane been produced in which a crew of two has been given such unrestricted fighting view and field of fire as in the new Westland-Hill "Pterodactyl V." This two-seater fighter is fitted with the Rolls-Royce steam-cooled "Goshawk" engine of 600 h.p. or so, and should be a formidable opponent from a performance and a fighting point of view.

The Outlook

A Running Commentary on Air Topics

World's Records

FROM the official list of world's records published this week (see pp. 844-845), the somewhat sad fact emerges that not a single world's record is now held by Great Britain. British engines (Bristol "Pegasus") have, it is true, played their part in establishing the pure altitude record and the record for height with a useful load of 11,000 lb., and a Siddeley "Genet" has a light plane record, but no British aircraft now holds a world's record. It is perfectly true, of course, that many of the seventy-odd records are footling, but a good number are worth while. Some, such as the pure speed record and the long-distance records, entail expenses rather beyond the capacity of firms and private individuals, but there are still quite a number of records worth going after, and a good many which British aircraft could beat. For some years the French policy was for the French Air Ministry to offer monetary rewards to the French constructor whose machine established a new record. We would not suggest that our own Air Ministry should do the same, but there seems to be an opportunity here for some wealthy British sportsman to come forward with an offer.

The Copenhagen Aero Show

IT is to be hoped that the attendance, particularly that from other countries than Denmark, will be considerable at the Copenhagen Aero Show which opens this Friday, because British aircraft manufacturers are, together with British accessory and aero engine manufacturers, filling a considerably larger portion of the Forum than anyone else. Twenty-seven firms form the S.B.A.C. exhibit out of a total of twenty-eight exhibitors. Some of these are collective exhibits, but nevertheless ours should be a "brave" show. Apart from what will be seen in the Forum, several firms are sending aeroplanes and pilots to the Kastrop aerodrome at Copenhagen, so that visitors may actually see the machines demonstrated during the show. It is a pity, perhaps, that there is not greater participation on the part of foreign aircraft manufacturers.

Competition is a good thing, and we are confident that our products can safely stand comparison with those of any other country. Apart from the Czech engine firm of Walter, collective exhibits by the French Air Ministry, the Civil Aviation Administration in Moscow, and a German firm, all the exhibitors other than British are Danish.

A De Havilland Achievement

THE facts that Messrs. Reid and Ayling failed in their attempt on the distance record and that their Atlantic flight was actually the twenty-fourth from West to East, do not reduce the interest in the latest "record" flight. They themselves were the first to admit that the show was a failure as such, though it was actually the first non-stop flight from Canada to England.

We have always imagined that the D.H. "Dragon," besides being almost the first civil machine to be capable of making a profit for itself, was theoretically capable of coming very close to the distance record provided that an overload chance was taken. The machine carried 612 gallons of fuel and took off in a virtual calm in a matter of 1,600 yards. Apart from the special tankage arrangements and general economy tuning, the machine was standard in every respect.

The De Havilland Company is to be congratulated on such a worthy standard production.

A Fighting "Pterodactyl"

ATTENTION was first drawn, in *Flight* of August 2, to the production by the Westland Aircraft Works, of Yeovil, of a machine incorporating features likely to modify the subject of air-fighting tactics. The "Pterodactyl V," as the machine is called, is shown in the photograph on the opposite page. It will be observed that it retains many of the features of previous "Pterodactyls," such as swept-back wings and undercarriage wheels in tandem. It differs, however, from the earlier models in that the engine, a Rolls-Royce steam-cooled "Goshawk" of some 600 h.p., is mounted in the nose of the short fuselage, while pilot and observer are situated behind the wing, from which position the view in all essential directions is exceptionally good. The gunner occupies the rear position, and has an uninterrupted field of fire over the whole hemisphere behind the machine.

It is interesting to note that the designers, Capt. Hill and the Westland technical staff, have chosen the biplane, or at least the *sesquiplane*, arrangement. The reason for this would appear to be that with the undercarriage wheels in tandem it is necessary to provide means for steadying the machine on the ground, and the short lower wings form convenient supports for the outboard wing tip skids.

Flying controls consist of trailing edge flaps which, when worked in unison, act as elevators, and when worked in opposite directions perform the functions of ailerons. Directional control is by rudders on the wing tips. The rudders, when worked together, form very effective air brakes. Autoslots are provided on the outer leading edge of the main wing, so that the "Pterodactyl V" has made use of all the latest aids to aerodynamic efficiency.

A feature which should make the machine very useful as a military type is the manoeuvrability. The short length results in sensitive elevator control, and the wing tip rudders give a drag tending to slow down the wing on the inside of a turn, so that directional control is also very powerful.

A Melbourne Race Scare

NOT long ago we drew attention to the importance of fuel and oil supplies in the England-Australia race, and pointed out that the result of the race might well be influenced by the organisation of those supplies. That our view was in no way an over-statement is proved by the report that some of the American entrants are investigating the problems of providing their own supplies, and have, so we are informed, already spent considerable sums to this end. Apart from this, many competitors have had a great deal of special apparatus installed in their machines, which will have cost them a large amount of money, so what with this and other expenses which must at this stage have been incurred it does seem likely that undue importance need not be given to the report that most of the American entrants are withdrawing their machines from the race because they find the expenses too high. We are informed by the Royal Aero Club that there has been no official intimation of these supposed withdrawals. It has been obvious from the start that the race would be an expensive event, and as we pointed out when the race was announced, the first prize will be worth only about £7,500 outside Australia, and what with a fuel and oil bill of between £600 and £700, as it may be for a large machine, special equipment, laying out special supplies, insurance, freight to England, and finally the cost of the machine, the total expenditure is likely to exceed this sum.

THE ENGLAND-AUSTRALIA RACE

*Descriptions and Illustrations of Lockheed "Altair," "Orion" and "Vega" :
Wiley Post and the "Winnie Mae" : The "Irish Swoop"*

ENTRIES have been made of eight Lockheed aircraft—two "Altairs," four "Orions," and two "Vegas," for the MacRobertson England-Australia Race. Although Lockheeds are of American manufacture, two of these entries are from Australia and one from France. The machines will, of course, differ considerably in matters of equipment and tankage, but the following description, which applies to the standard types as at present being produced, should prove of interest to a large section of those people interested in the great race.

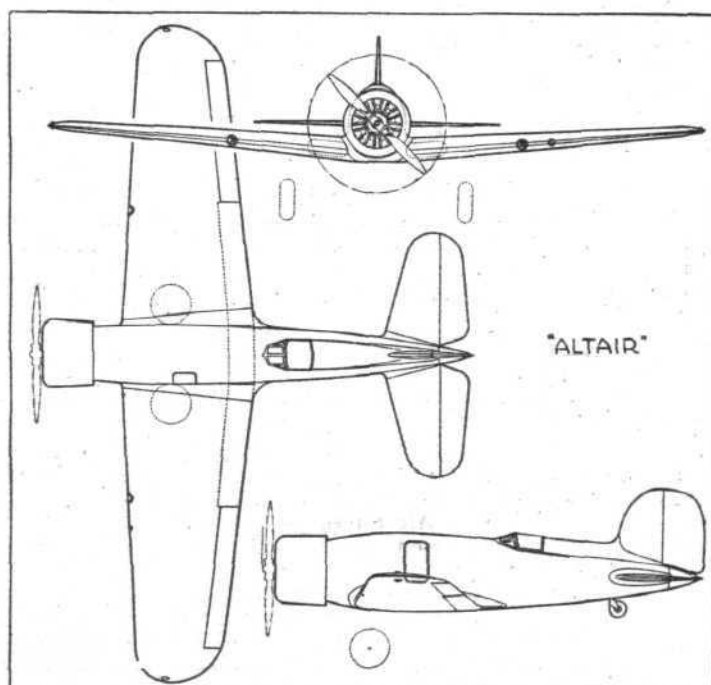
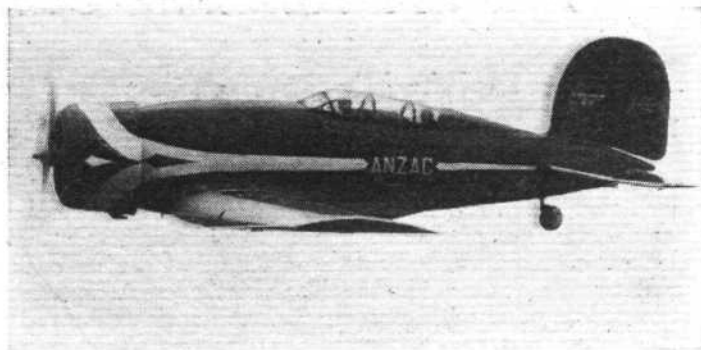
In the case of all these three Lockheed types the fuselage is a semi-monocoque structure with spruce plywood "shell" reinforced transversely with laminated diaphragms at an average spacing of 22 in., and reinforced longitudinally with spruce compression members and nickel steel tierods. Although the "Orion" and "Altair" are low-wing monoplanes and the "Vega" is a high-wing type, the structure of all three wings is similar. The wing is an all-spruce cantilever plywood-covered structure tapered both in plan and section. Spars are of the spruce box type. There is no external rigging, and the machine is trimmed by the bending up or down of "tabs" on the trailing edge of the ailerons. Tail surfaces are of similar construction, the fin being adjustable on the ground.

Both the "Orion" and the "Altair" have retractable undercarriages of a similar type. This uses a combined hydraulic and cable-operating mechanism, the retraction of the wheels involving an inward, rearward and upward movement. When fully hoisted or extended the gear locks automatically. Approximately forty seconds are required for hoisting operation, and the gear may be extended in about nine seconds. The gear extends nearly its full travel by its own weight, only a few strokes of the pump being necessary to complete the action. A safety signal is connected to the throttle which rings an electric bell if the landing gear is not fully down when the throttle is retarded to 800 r.p.m.

Engines

Most of the Lockheed "Altairs," "Orions," and "Vegas" use the Pratt and Whitney "Wasp" engine, although the Wright "Cyclone" has been fitted to some "Orions." The "Wasp" engines used are usually supercharged, being either S1D1's rated at 550 h.p. at 2,200 r.p.m. at 5,000 ft., or SC1's rated at 450 h.p. at 2,100 r.p.m. at 6,000 ft. This latter engine uses fuel of 80 octane value, has a compression ratio of 5½:1 and a blower ratio of 7:1. The S1D1 uses the same fuel and has the same blower ratio, but has a compression ratio of 6:1. With standard equipment the "Wasp" engine weighs about 750 lb.

Michel Detroyat is fitting a Hispano-Suiza engine in his "Orion." This is a Wright "Cyclone" built under licence by the Hispano-Suiza Co. In every case an N.A.C.A. cowlings is used, and most of the competitors will use variable pitch airscrews.



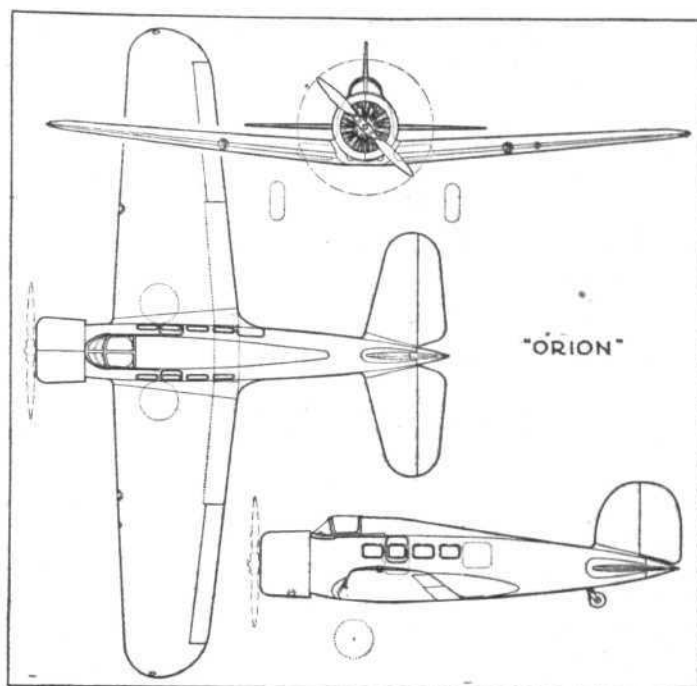
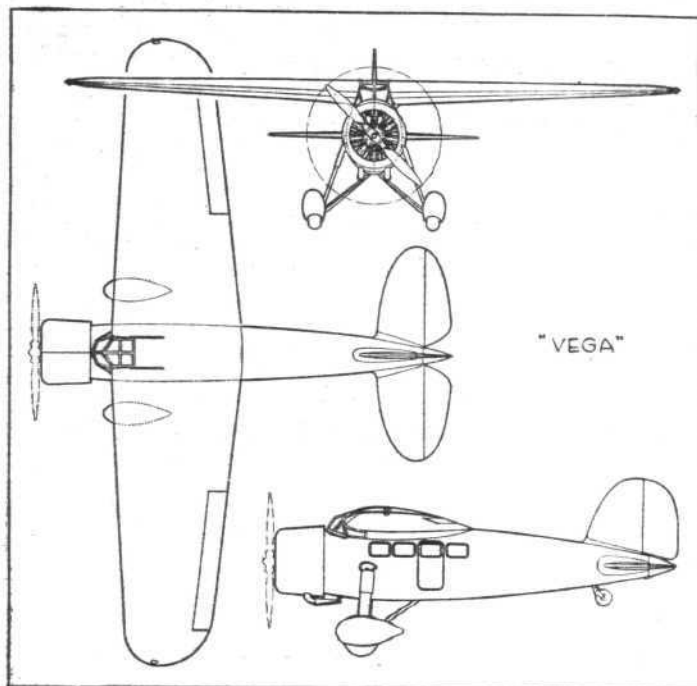
230 M.P.H. : Kingsford-Smith's "Altair" Anzac ("Wasp" S1D1), and below, G.A. drawing of the single-seater "Altair."

Wiley Post Supercharges

Winnie Mae, Wiley Post's historic Lockheed "Vega" of "round-the-world" fame, has been extensively modified for use in the race, and for an attempt on the altitude record. Powered with a "Wasp C" engine developing 420 h.p. at sea

DATA OF STANDARD LOCKHEED TYPES.

	"Altair" 8E.	"Orion" 9D.	"Vega."
ENGINE ...	P. and W. "Wasp" S1D1 ...	P. and W. "Wasp" S1D1 ...	P. and W. "Wasp" SC1
POWER ...	550 h.p. at 2,200 r.p.m. at 5,000 ft. (1 524 m)	550 h.p. at 2,200 r.p.m. at 5,000 ft. (1 524 m)	450 h.p. at 2,100 r.p.m. at 6,000 ft. (1 829 m)
SPAN ...	42 ft. 9½ in. (13.03 m) ...	42 ft. 9½ in. (13.03 m) ...	41 ft. (12.5 m)
LENGTH ...	27 ft. 10 in. (8.4 m) ...	28 ft. 4 in. (8.64 m) ...	27 ft. 6 in. (8.38 m)
WING AREA ...	294.1 sq. ft. (27.3 m²) ...	294.1 sq. ft. (27.3 m²) ...	279.1 sq. ft. (25.9 m²)
WEIGHT EMPTY ...	3,297 lb. (1 495 kg) ...	3,640 lb. (1 650 kg) ...	2,725 lb. (1 236 kg)
GROSS WEIGHT ...	5,800 lb. (2 630 kg) ...	5,800 lb. (2 630 kg) ...	4,750 lb. (2 146 kg)
WING LOADING ...	19.72 lb./sq. ft. (9.64 kg/m²) ...	19.72 lb./sq. ft. (9.64 kg/m²) ...	17.02 lb./sq. ft. (8.3 kg/m²)
MAXIMUM SPEED...	230 m.p.h. (370 km/hr) ...	225 m.p.h. (363 km/hr) ...	195 m.p.h. (312 km/hr)
CRUISING SPEED ...	205 m.p.h. (330 km/hr) ...	205 m.p.h. (330 km/hr) ...	170 m.p.h. (272 km/hr)
LANDING SPEED ...	63 m.p.h. (101 km/hr) ...	63 m.p.h. (101 km/hr) ...	60 m.p.h. (96 km/hr)
SERVICE CEILING...	22,000 ft. (6 720 m) ...	22,000 ft. (6 720 m) ...	18,000 ft. (5 490 m)
CRUISING RANGE...	1,025 miles (1 650 km) ...	720 miles (1 160 km) ...	550 miles (880 km)



HIGH AND LOW WINGS: The "Vega" ("Wasp" SC1) and "Orion" ("Wasp" S1D1).

level, this machine, in 1930, flew from Los Angeles to Chicago in 9 hr. 9 min. 40 sec., winning the transcontinental non-stop event of the National Air Races in that year. The following year, Post, accompanied by Harold Gatty, established a "round-the-world" record of 8 days 15 hr. 51 min., and in July, 1933, Post, flying solo, circled the globe in 7 days, 18 hr. 49 min. Before this latter flight the "Wasp C" engine was converted into an SC "altitude" type by the installation of a supercharger. Post was so impressed with the benefits derived from this installation that he has had a second supercharger mounted in series. The use of two superchargers with the "Wasp" should boost the 4.37 lb. atmospheric pressure at 30,000ft. to approximately 15 lb. intake manifold pressure, which corresponds to that at sea level. Thus the "Wasp" can maintain its full rated power up to 30,000ft. To make full use of this power Post has installed a special controllable pitch airscrew. He hopes that the machine will make a top speed of about 350 m.p.h. at the great altitudes at which he intends to fly. The cruising speed should exceed 275 m.p.h.

Not only the engine, but Post himself will be supercharged. From the first supercharger he will be supplied with air under pressure entering the front of an aluminium helmet. Attached to the helmet will be an airtight rubberised suit through which the air will be forced, passing out through exhaust valves in the boots. Thus he will be supplied not only with oxygen, but with the pressure needed for bodily comfort. A mixing valve will enable him to control the temperature of the air entering the helmet and suit, while an extra inlet is provided from an oxygen tank for use at extremely high altitudes.

In the cockpit is every conceivable aid to navigation, including an automatic pilot and a Westport radio set.

"Smithy" Pays Last Instalment

Sir Charles Kingsford Smith's "Altair" has a "Wasp" S1D1 engine, and a capacity for 500 gallons of fuel, which should give a range of about 3,500 miles at a speed in excess of 200 m.p.h.

It is reported that "Smithy" paid the final instalment on the "Altair" with the money obtained by the sale of the "Codock" monoplane which is employed on the Sydney-Newcastle service. The machine was shipped to Australia on June 27, the San-Francisco strikers having agreed to load it.

"Vega" Entry from Australia

Mr. James Woods, who, accompanied by Mr. H. C. Miller, will fly in a Lockheed "Vega," recently visited the Lockheed factory at Burbank, California, to confer with engineers on the fitting out of this machine for the race. Mr. Woods is Western Divisional manager of the MacRobertson-Miller Aviation Co. of Australia. The "Vega" is owned by Mr. H. C. Miller, managing director of the company, and is the machine in which the late Lt. Com. Glen Kidston, R.N., made a fast flight to the Cape in 1931. The "Wasp" SC engine will drive a Hamilton standard controllable pitch airscrew. This machine is at present at Hanworth.

"Irish Swoop"

Col. Fitzmaurice's Bellanca monoplane *Irish Swoop* is nearly completed. Signor Bellanca, the designer, says: "We who are building new 'planes for the race are delving deep into our resource of inventiveness. For the usual order in our factory we work at walking speed, but for this job we are running. We are keyed up now quite as much as the pilots will be in October." Speaking of the *Irish Swoop*, Signor Bellanca states: "It is not like a small racer. Though only a two-seater, it will have 280 square feet of surface, which is equivalent to that of a six-passenger 'plane.'"

An announcement applying to insurance for the race is on p. 858.

MACROBERTSON ENGLAND-AUSTRALIA AIR RACE

October 20—November 4.

PRIZES:

Speed Race: 1st. £10,000 and Gold Cup; 2nd, £1,500; 3rd, £500.
Handicap Race 1st, £2,000; 2nd, £1,000.

Sixty-four entries representing fourteen nations

Start: Hatfield. Finish: Melbourne.

Control points (Handicap Race in italics):—*Marseilles, Rome, Athens, Aleppo, Baghdad, Bushire, Karachi, Jodhpur, Allahabad, Calcutta, Rangoon, Bangkok, Alor Star, Singapore, Batavia, Rambang, Koepang, Darwin, Newcastle Waters, Cloncarry, Charleville and Narrawmine.*

Total Distance (Great Circle):—11,333 miles.

PRIVATE FLYING

A SECTION FOR OWNER-PILOTS
AND CLUB MEMBERS

HAVING recently flown by night to Rotterdam, my thoughts naturally turn to the problems of night flying from the point of view of the private pilot.

The necessity for cultivating the ability to fly during the hours of darkness hardly needs emphasising. Any form of transport which is limited in its operation to the hours of daylight is necessarily handicapped in its sphere of usefulness, and the pilot who is thus restricted is not deriving full advantage from his or her machine.

The convenience of using one's aeroplane in this way is well illustrated by the particular journey I found it necessary to make—to keep an after-dinner appointment in Belgium with the chief of the K.L.M. On this occasion I was accompanied by Lord Stonehaven, who, as Major Baird, was Parliamentary Member of The Air Board formed early in the war. Lord Stonehaven has occupied many important posts since those days, and has recently retired from the office of Governor-General of Australia, and during this period he was able to see a great deal more of Australia by utilising the aeroplane than would have been possible by other means. He has never allowed his interest in aviation to flag, and takes every opportunity of helping on the development of flying. On this particular flight we cleared Customs at Heston, and within two hours had landed at Rotterdam. In flying from one aerodrome to another, each provided with well-organised night flying facilities, little difficulty should be experienced under normal conditions, but one would not encourage the inexperienced pilot to embark on such a journey without a great deal of preliminary preparation. Night flying in the not too distant future will undoubtedly become commonplace, but only those pilots who have undergone the necessary training can expect to make such flights with safety and regularity.

Flying by Night

THE private pilot will follow up his normal tuition with a course in aerial navigation and also in blind or instrument flying, and until proficient in these branches he will be well advised to confine his activities to the hours of daylight. Once qualified, however, he will find many attractions as well as advantages in flying by night. He will, of course, need to have his machine fitted with the lighting system necessary under the provisions of the Air Navigation regulations, and will, in addition, take particular care to see that his machine is fitted with a really up-to-date and reliable set of illuminated instruments.

Until he has had a considerable amount of experience, the owner-pilot will confine his night flights to known routes between well-lighted aerodromes, and to good weather conditions. He will take even more care to obtain reliable weather reports than if flying by day. There are many features which are peculiar to night-flying conditions, and his landmarks will vary considerably from those he will utilise in daylight flying. He will, also, do well to avail himself of the valuable information which the Aviation Department of the Automobile Association place at the

disposal of their members. From this organisation he can obtain specially marked maps showing not only the position of aerial beacons on the organised air routes, but the various marine lights which are a considerable help to navigation when flying along the coast and overseas. A knowledge of the periodicity of such lights will enable the pilot to check his course, and such points should be well studied beforehand. For regular night flying in all weathers the private pilot of the future will not be fully equipped unless his machine is fitted with a reliable wireless receiving set,

for the tendency to institute systems of zone control, such as now operate in the vicinity of Croydon during bad weather, will increase in the more important centres as air transport develops.

Aerodrome Lighting

AT the present time there are comparatively few aerodromes in the country which are adequately equipped with night flying facilities, but with the further development of internal air lines we may look for considerable advances in the near future. In any case it is desirable that the machine to be used for night flying

should be fitted with good landing lights equivalent to the head lights of a car.

Apart, however, from the actual lighting equipment of the aircraft itself, aviation lighting may be divided into two categories—airway lighting and aerodrome lighting. The first-named consists of special aerial beacons spaced with reference to the topography of the route, and this is, of necessity, a rather expensive provision. So far, the routes lighted in this country, which are confined to those utilised by the International Air Transport companies, have been equipped at the expense of the State. The cost of aerodrome lighting is usually borne by the aerodrome authorities, and this need not necessarily be very great. The Customs airports, and the principal aerodromes in this country which cater for international traffic, will naturally comply as closely as possible with the international standards as advocated by the British Aviation Lighting Committee. For private aerodromes, and those not so frequently used, an effective and less expensive method may be devised, based on the system universally adopted. These essential requirements consist of an aerodrome beacon emitting a low-intensity light, boundary lights spaced sufficiently closely to indicate clearly the perimeter of the landing ground, a method of indicating the direction of the wind by means of an illuminated sign, and some means of marking clearly the position of the immediate landing area. Flood-lighting, if proper precautions are taken to overcome the dazzle effect, may be used for this purpose, but in certain conditions of poor visibility this method may prove extremely unsatisfactory. I have landed at Heston when the wind has been in the east and when the London smoke has consequently drifted, and have found the flood-lighting in such circumstances to be positively dangerous. An inexpensive lighting system which I prefer, and which has been largely used on the Continent for landing purposes, is arranged by demarking a "lane" on the aero-

NOTES

by

LORD SEMPILL

A.F.C., F.R.Ae.S.

Private Flying

drome in the direction of the wind by placing green, white, and red lights—generally hurricane lamps—in such a position that the pilot may see clearly where and how he should land. The coloured lights will be placed so that the pilot will come in over the green lights, knowing that

he should touch ground at the white and not overrun the red lights. Such a method will provide all that is really necessary to effect a safe landing during the hours of darkness, and is more effective than flood-light illumination when misty conditions prevail.

THE FIFTH LONDON-NEWCASTLE RACE

Mr. L. Lipton, flying a Gipsy III Moth, wins at 124 m.p.h.

LONGER than any other air race in this country, the annual race from Brooklands to Newcastle (Cramlington Aerodrome) held last Saturday attracted quite considerable interest. This year, the fifth since the race was started, there were fourteen starters ranging from the "Moth" ("Gipsy I") of Mr. C. Tutt to the "Hawk M2" ("Gipsy Six") of Sir Charles Rose.

The course is 264 miles in length, and therefore affords every opportunity for advantage to be taken of a knowledge of the variations of wind with height—a point which is far too often forgotten, particularly by younger pilots, who seem to think that air racing invariably necessitates flying through the gaps in hedges or between trees. They might learn from such an old hand at the game as, say, "Wally" Hope. Even when the wind is abeam it pays to understand the "pros and cons" of high flying. This point was proved in the race from Cramlington to Leeming Bar which was held the day after the race from Brooklands. Mr. Sparkes estimated that, at the time of the race, the wind would veer a little to the north, and so be behind him if he flew fairly high, and that he would also get more out of his machine by climbing up out of the bumpy weather. The others kept down close to the ground and watched, with mixed feelings, the way in which Mr. Sparkes overtook them.

Retirements

The handicapping on Saturday was in the hands of Messrs. Dancy and Rowarth, so we were not surprised when the first three came in within 26 sec. of one another. It was a really fine finish. Mr. Tutt ("Moth") and Miss Jackaman landed at Sherburn for petrol. Mr. Naish turned back to Hanworth, and Sir Charles Rose landed at Walker, a very few miles from the finish. The latter had exceedingly bad luck because he had the race well in hand, and would probably have won. Unfortunately a stoppage in the fuel pipes starved his engine and caused the forced landing almost within sight of the finishing line. We wish him better luck next time.

Apart from these three, all the starters finished. Mr. Lipton's win was a very popular one, as this pilot's performance in the King's Cup was looked upon as one of the best in that race. His "Moth," which once belonged to Mrs. Mollison, when she was still Amy Johnson, was beautifully streamlined and faired at every point, for the most part by Mr. Lipton himself.

While waiting at Cramlington for the finish of the race, the Newcastle-upon-Tyne Aero Club did some excellent formation flying, Mr. "Bill" Thorn some perfect aerobatics on an Avro "Cadet" (Siddeley "Genet"), and various club members raced a short course in full view of the aerodrome, the winner of the last being Mr. McGeavor, the Club's instructor.

On Sunday another race was organised to Leeming Bar for ten of those pilots who had flown to Cramlington in the



Mr. L. Lipton (right), who won the London-Newcastle race in a "Moth" (Gipsy III). Mr. G. E. Lowdell (left) was second in a "Tomtit" (Wolseley A.R.9).

previous day's event. The aerodrome is operated by Yorkshire Air Services, and is attached to the Newton House Hotel. This race turned out to be one of the best ever seen, six out of the ten getting home within a space of 38 sec. The prize was a cheque presented by Mr. F. R. Walker, who instituted the race as an annual event. Mr. Lipton gained first place by half an airscrew boss from Mr. Henshaw ("Leopard Moth"). Com. Croxford, of Yorkshire Air Services, who operate from the aerodrome, made all the competitors welcome and serviced their machines, but, unfortunately, despite previous notice, the hotel failed dismally to service the pilots' "inner men" with anything like the same efficiency.

Registration.	Entrant.	Pilot.	Aircraft and Engine.	Time of Start.	Time of Finish.	Average Speed.	Position.
				h. m. s.	h. m. s.	m.p.h.	
G-ABPK	C. H. Tutt	Entrant	Moth (Gipsy I)	13 30 00	16 16 24	95.19	11
G-AAZE	Miss Jackaman	Entrant	Moth (Gipsy II)	13 35 28	Landed at Sherburn.		
G-ACCW	C. MacDonald	Flt. Lt. V. Selby Lowndes	Moth (Gipsy Major)	13 40 36	16 11 28	111.65	10
G-ABVW	L. Lipton	Entrant	Moth (Gipsy III)	13 54 13	16 01 56	124.02	First
G-ABDI	Germ Lubricants, Ltd.	J. Watson	Puss Moth (Gipsy III)	13 54 43	16 08 40	118.25	9
G-ABUU	Miss C. Leatherheart	Entrant	Swift (Pobjoy)	13 55 12	16 05 30	121.57	7
G-ABLG	Sqd. Ldr. W. Runciman	Entrant	Puss Moth (Gipsy III)	13 57 35	16 04 30	124.81	5
G-AAIG	Maj. Moller	A. Naish	Hobo (Pobjoy)	13 57 35	Returned to Hanworth.		
G-AAVT	C. Napier	Entrant	Hendy 302 (Hermes IV)	14 01 13	16 02 22	130.75	3
G-ABOD	Lord Nuffield	G. Lowdell	Tomtit (Wolseley AR 9)	14 01 40	16 02 14	131.38	2
G-ACKN	W. Porter	S. Sparkes	Leopard Moth (Gipsy Major)	14 06 17	16 06 19	131.96	8
G-ACLO	A. Henshaw	Entrant	Leopard Moth (Gipsy Major)	14 06 17	16 04 44	133.73	6
G-ACGR	Sir John Kirwan	Entrant	Gull (Javelin)	14 15 54	16 04 29	145.88	4
G-ACTE	Sir Charles Rose	Entrant	Hawk M2 (Gipsy Six)	14 30 26	Forced landing at Walker.		

Private Flying**SAVING TIME***A Fast Journey on a "Hawk Major" : Some Impressions of Its Characteristics*

FLYING is primarily useful because it is faster than other means of transport, and, within limits, the faster a machine the more likely it is to find favour with users.

Not long ago we experienced at first hand just how much speed means when flying down to the Bristol Club's meeting in the new "Hawk Major" ("Gipsy Major"). The wind was blowing strongly from the west and most visitors were full of stories of the time they had taken over the journey. It took us just 38 minutes.

The journey home again was even more spectacular. After the Bristol meeting we went on to Cardiff Airport, the home of the Cardiff Aeroplane Club, and then, flying high to make the best of the wind, reached Reading in 34 minutes.

The "Hawk Major," it will be remembered, has only a "Gipsy Major" engine, and the cockpits have in no way

been skimmed as to size, yet this machine cruises at a very easy 135 m.p.h., and, perhaps even more important still, does not land any faster than the standard "Hawk"—42 m.p.h. Figures such as these make the idea of aeroplane ownership most attractive.

Although it is an open cockpit machine, the "Hawk Major" is particularly free from draughts, and there is no need to wear goggles except when visibility is poor and the pilot wishes to "crane out" rather more than usual. The clean design, largely consequent upon making the undercarriage a full cantilever one, gives the new "Hawk" a long flat glide if brought in fast, but, like its predecessor, the machine can be glided quite slowly with perfect safety and under perfect control so that landing in small fields has no terrors. Furthermore, the wheel brakes can, if necessary, be used hard.

VARIETY AT HANWORTH*Instruction is Given by Aircraft Exchange and Mart on Six Different Types, and These May be Hired or Chartered at Competitive Rates*

STANDARDISATION of machine types in clubs and schools is essential to really economical working, but, at the same time, this standardisation is the partial cause of flagging interest among the pupils. Once he has got his ticket and passed into the cross-country and passenger categories, the amateur begins to hanker after new experience, and many schools are allowing for this tendency in their re-equipment.

It is doubtful, however, if any of them possess such a range as is available at Aircraft Exchange and Mart at Hanworth Aerodrome. In all there are nine machines, made up of three Blackburne B.2 Trainers, side-by-side machines for which the firm holds the sole concession, an Avro "Club Cadet," a Percival "Gull," two D.H. "Puss Moths," a D.H. "Gipsy Moth," and an Airspeed "Courier."

Normal flying rates range from £3 per hour, dual for the "Cadet," the "Blackburne," and the "Moth," to £6 10s. for the "Courier," and from £2 15s. per hour solo. Both the B.2. Trainer and the "Puss Moth" may be hired at £4 per day (dry), plus a small insurance figure (13s. 9d. in the case of the cabin machine), and the "Gull" at £6 per day. Special insurance figures are quoted for longer periods or special journeys. The five-passenger Airspeed "Courier" may be chartered at 10 guineas an hour. Charter mileage rates are 9d. for one or two passengers in the "Puss Moth," or 1s. in the

"Gull," and 1s. 6d. per mile in the "Courier" for either three, four, or five passengers.

A point of special interest is that night flying instruction, which is provided at £6 per hour, is given in either of the equipped "Puss Moths." The private owner or hirer, after all, is more likely to be flying a cabin machine in any long-distance travel necessitating late landings, and the instruction and solo practice in such a machine is likely to be more useful.

Pilots may be trained for either "A" or a Commercial licence, or both. The Blackburne B.2 is used for initial training because it is considered that the side-by-side arrangement makes for greater confidence in the earlier stages.

A short flight in this machine showed that, with the inverted "Gipsy" engine, the tail-down view is reasonably good, and the flying view, except in certain quarters, excellent from the training aspect—though the nervous instructor might be worried as a pupil, in whom he has little confidence, side-slips away from him when near the ground!

Landing, even without previous experience of the type, presented no difficulties, though, when flying alone or with an inexperienced passenger, a yawing movement would be necessary to gain a full view of the aerodrome immediately before the landing approach. Side-by-side seating has advantages for which something must necessarily be paid.

A Yorkshire Aerodrome

Development has been going on apace at Newton House Hotel Aerodrome, Londonderry, Yorkshire, and this now provides runs of 800 yards in each direction. Petrol and oil supplies are available. There is hangar accommodation and a qualified ground engineer—Mr. E. A. Pepper, late of Reading. Furthermore, a swimming pool has been built in the hotel grounds.

Yorkshire Air Services School has steadily increased hours flown from 25 during April to 201 last month, and there are more than forty pupils, two of whom are going for their "B" licence. Three machines are in use, two Gipsy I "Moths" and a Miles "Hawk," and the instructor is Com. C. W. Croxford.

The International Meeting at Lympe

In recent issues various details of the Second International Meeting, to be organised by the Cinque Ports Flying Club on September 1 and 2, have been given. This year about a hundred guests have been invited from abroad in order to repay, in some small measure, the hospitality that has been extended to British pilots during the summer. The expenses involved have been guaranteed entirely by members of the club.

Entry forms for both the Folkestone Air Trophy and the Cinque Ports Wakefield Cup are ready to be sent out, and private owners are invited to write to the club secretary so that they may receive their forms before the closing dates. The entry fee is £2 2s. up to 7 p.m. on August 20, and £4 4s. up to the same time on August 25.



FOR THE INTERNATIONAL MEETING : On the left is the Wakefield Cup, for "A" licence pilots, and on the right is the Folkestone Air Trophy.

FROM THE CLUBS

Events and Activity at the Clubs and Schools

BROOKLANDS

The weather has been very squally during the past week, but a good average was maintained with 45.10 hours' solo and 59.50 hours' dual flying, and cross-country flights were made to Canterbury, St. Austell, High Post, and the Isle of Wight.

The Masonic Club turned up in full force early last week, and are now in their new buildings; they will start flying in a few days.

NORFOLK AND NORWICH

The boys attending the Public Schools Aviation Camp, which is being held on the aerodrome, arrived on Thursday and Friday last week. The following schools are represented: Cranford, Shrewsbury, Taunton, Stowe, Wrekin College, King's College School, Wimbledon, Wycliffe College, and Rossall School; the camp is in charge of Mr. H. Birchall, an assistant master at Taunton School, who qualified in the early days of the club. They are being trained by the club instructor, Capt. J. Collier, sleep under canvas, and dine in the club mess. When the weather is bad they are given lectures in the club house on the theoretical side of flying by F/O. A. J. S. Morris. Mr. H. Birchall is coaching them for their oral examination, and Mr. F. H. Low will give a short course on aerial photography. Their training will also include courses in navigation, engine maintenance, compass and map reading.

HERTS AND ESSEX

The final of the competition for the "Shelmerdine" Challenge Bowl was flown on August 5. The winner was P. T. Buckingham, with J. A. Macdonald and E. L. Gay runners-up. The standard of flying in this competition was so high that these three competitors tied with maximum marks, and were invited to fly in a final. The first course covered 115 miles and involved two landings at other aerodromes. The final consisted of pin-pointing to two points disclosed to the finalists ten minutes before their take-off. Each leg of the course had to be flown at 75 m.p.h., and points were lost for exceeding or failing to attain this speed. On return engines were shut off at 2,000ft., and points were awarded for the approach and landing.

The next competition will be held on August 26 for the "Mollison" Challenge Cup, and will consist of aerobatics—loop, stalled turns to the right and to the left (engine off), two turns of a spin to the left and two to the right, and a landing off the last spin.

MIDLAND

The club has purchased a new "Moth Major," and two members, Messrs. E. and V. Parry, have also purchased a British Klemm. A total of 52 hr. 15 min. was flown last week, with a number of useful cross-country flights.

HATFIELD

The Atlantic flyers, Mr. L. G. Reid and Mr. J. R. Ayling, landed at Hatfield on Thursday evening at about 7.30 p.m. Mr. Reid, incidentally, was a member of the London Aeroplane Club, and learnt to fly with them.

More and more work is being carried out on the new D.H. buildings at Hatfield, and machines are now being brought from Stag Lane for assembly and testing.

BARNSTAPLE

The membership of the Club at Heanton Court, Barnstaple, run by Messrs. Boyd and Nash, has now passed the 200 mark, and 35 hours have been flown during the last fortnight. Apart from school work, the Monospar has been in regular service on charter work, and the Desoutter three-seater, owned and flown by Mr. J. E. D. Scott, has been away from the aerodrome quite a lot.

NORTHAMPTONSHIRE

Dawn patrols having fallen rather flat, the Northamptonshire Aero Club is challenging clubs to a midday patrol on Sunday, August 26. Attackers must get through between 12.30 and 12.45, flying between 500 and 1,000 feet, without losing their identity to the defenders. Those who succeed—and probably most of those who fail!—will have a drink on the house, and lunch will be served in the clubhouse. Some forty entries have already been received.

READING

At the Phillips and Powis School of Flying the flying time during the week ending August 9 was 67½ hours.

Mrs. B. MacDonald has flown back from Baghdad in her Miles "Hawk," where she has been on a visit to her husband, Sqd. Ldr. A. D. MacDonald, who is on the Intelligence Staff in Iraq. A Reading Club member, Miss H. M. Lyon, made her first parachute drop during the week.

The second of the Miles "Hawks" (Cirrus IIIa), for the re-equipment of the School, is flying. A dawn patrol will be held on Sunday, September 9, between 8 and 8.30 a.m.



ABOVE THE CLOUDS: In this view the fine lines of the British Klemm "Eagle" (130 h.p. "Gipsy Major") are particularly noticeable, and some idea can be gained of the pilot's range of vision, both above and below. The "Eagle's" cruising speed, with "Gipsy Major" engine, is 130 m.p.h. (Flight Photo.)

THE HUNGARIAN "PICNIC"

The closing date of entries for the tour of Hungary, organised by the Magyar Touring Club, which was briefly described in last week's issue, has been extended.

Special terms, incidentally, have been obtained for visitors during their stay, and it is estimated that the tour should cost about £5 per head, excluding fuel and oil, which, with a light aeroplane, should not cost more than £4. Holders

of Air Touring Cards may make use of the touring cheques of the Magyar Club, which are obtainable from the Automobile Association.

A delightful little illustrated "diary," after scrapbook style, describing the tour, is on exhibition at Farnum House and at Heston. Judging from the photographs, Hungary is worth visiting—preferably by air this year.

THE FOUR WINDS

ITEMS OF INTEREST FROM ALL QUARTERS

The Soviet Mission

Returning French and Italian visits to Russia, a squadron of Soviet military aeroplanes arrived in Paris and Rome last week. In both capitals they received a warm welcome, and in Rome the mission was received by Signor Mussolini.

A Round-Australia Record

On August 12 Mr. James Melrose—who has entered for the England-Australia Air Race—completed, at Parandfield Aerodrome, Adelaide, a flight round Australia in 5 days 11 hours, thus beating the record for a similar flight established in 1931 by Mr. H. Broadbent by about two days. Mr. Melrose, who learnt to fly sixteen months ago, was flying a "Puss Moth" monoplane, and followed the coast closely throughout.

French Airwoman's Records

Flying the Caudron low-wing monoplane (10 h.p. Renault) on which Arnoux won the Deutsch de la Meurthe Race, Mlle. Hélène Boucher established several new records at Istres last week. The most important of these was the ground speed record (over 3 km.) previously held by Mrs. May Haizlip, Mlle. Boucher's average for the four flights being 444.26 km/hr. (276 m.p.h.). Other records established by Mlle. Boucher were: (a) Woman's Speed Record (100 km.) 412.308 km/hr. (256.2 m.p.h.). Previous holder, Miss Amelia Earhart, 281.47 km/hr. (175 m.p.h.); (b) International Speed Record (1 000 km.), 409.20 km/hr. (254.3 m.p.h.). Previous holder Maurice Arnoux, 398 km/hr. (247.3 m.p.h.), now awaiting homologation; (c) Women's Speed Record (1 000 km.) as above, and beating the 254 km/hr. put up by her during the "12 Hours of Angers" last month. Mlle. Boucher now holds altogether seven World's Records, including one for altitude, in the Women's Category, which she established some time back.



A FORCED LANDING WITH REASON: Just in case there may be some pilots who underrate the weather with which our English pilots have to contend, we publish this photograph of a Short "Scion" taken by Mr. A. Irwin just after he had decided that discretion was the better part of valour. The black clouds behind the machine are right down on the ground and completely block the way to Aberdeen, a journey which on this occasion took seven hours instead of the usual three or so.

Twenty-five Years Ago

From Flight of August 14, 1909.

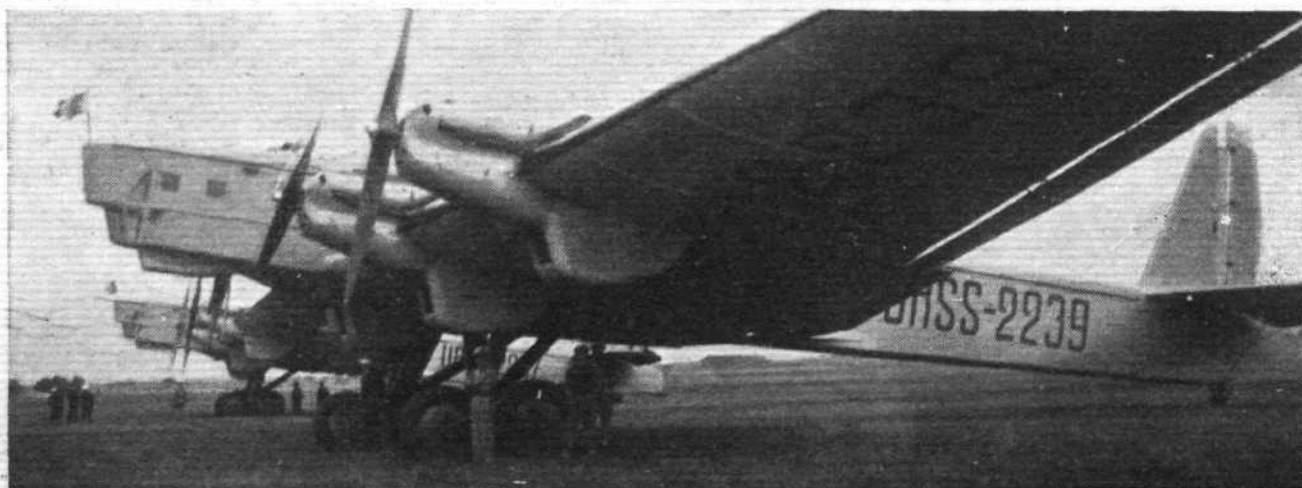
"A correspondent writes complaining that permission has been refused him to use Laffan's Plain for experimenting with his motor-driven aeroplane, and he also mentions that other suitable places, like Wormwood Scrubbs, Hackney Marshes, and Wimbledon Common, are closed to flyers, even though none of those places are much frequented during the greater number of hours of day-time. It appears that in response to his application he has been recommended to Salisbury Plain. He very naturally feels aggrieved that any difficulties should be put in the way of British experimenters, particularly now that so much leeway has to be made up in this country."

Pond and Sabelli Returning

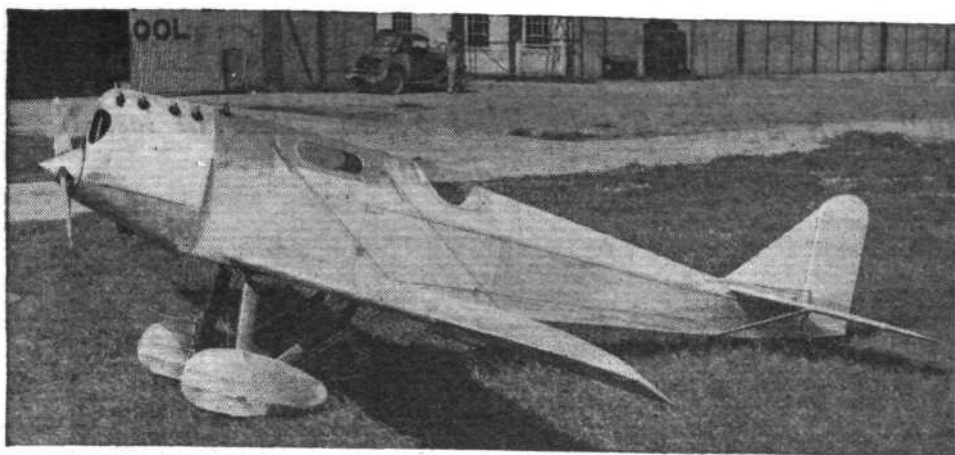
Capt. G. Pond and Lt. Sabelli, who attempted a non-stop flight from New York to Rome last May, planned to leave Rome on Wednesday on their return flight to New York, via Dublin and Newfoundland.

Pity the Poor Hyæna!

Lt.-Col. Sir Sandeman Allen, on July 30, in the House of Commons asked the Under-Secretary of State for Air for how many nights Service aeroplanes were to practice over London. Crushingly polite, Sir Philip Sassoon replied: "As my hon. and gallant friend will now be aware, the air exercises ended on July 26 at 9 a.m.; they had lasted for three nights." Not to be suppressed, the gallant lieutenant-colonel continued: "Is the right hon. Gentleman aware that the inhabitants of Regents Park, including the hyænas at the Zoo, were awakened last Wednesday night by the night flying?"



SOVIET MISSION TO PARIS: Two of the A.N.T.14 machines, which flew from Russia to Paris, at Le Bourget.



AN AUSTRALIAN PRODUCTION: The Wicko "Wizard" (Cirrus II engine) was designed by Mr. G. N. Wikner and does 120 m.p.h. Mr. Wikner is now looking for suitable opportunities in this country.

Move Along, There, Please!

During the next few weeks the Metropolitan Police will be carrying out experiments in regulating traffic from the air with an Autogiro. This machine, equipped with two-way wireless, will make flights over London and take observations of the traffic at various points.

Aircraft on Liners

There will be ample storage room for aeroplanes on the top deck of the new Cunarder 534, according to *The Daily Telegraph*, and, while it is not yet disclosed whether aeroplanes will be used for hastening the mail service, the "stepped" formation leading down from the top deck suggests that 534 may eventually be used as an ocean aerodrome.

Martin Bombers in the News

A contract has been placed by the U.S. Army Air Corps with the Glenn L. Martin Co., of Baltimore, for 81 Martin Bombers (2 Wright "Cyclone" F.S.). The order, which amounts to 3,748,798 dollars, is said to be the largest order for military aircraft ever given in peace time. The machines will cost 3,195,450 dollars, and spare parts 553,348 dollars. Ten Martin Bombers of this type are at present undertaking a flight to Fairbanks, Alaska.

L.Z.129

The largest airship in the world. L.Z.129, is nearing completion at Friedrichshafen. She is slightly longer than the *Macon*, and will have a gas capacity of 7,070,000 cubic feet, and the heavy oil engines, which give a total of 4,400 h.p., make possible a range of 8,000 miles without refuelling. Fifty passengers, a crew of 35, and 10 tons of freight will be accommodated. Interesting fea-

tures are a smoking room and a hold for the shipment of cars.

Victor Smith Returns by Boat

Mr. Victor Smith, who failed in his attempt on the Cape-England record, has left Port Etienne, Senegal, for England by steamer.

Gar Wood Buys Sky Chief

Gar Wood, designer, builder and racer of several famous speed boats, has bought the Northrop "Gamma" *Sky Chief*, formerly flown by Capt. Frank Hawks.

The Ellsworth Expedition

The Ellsworth Expedition's aeroplane, which was damaged by ice last January, has now been repaired, and is expected in Auckland at the end of this week.

New French Air Stamp

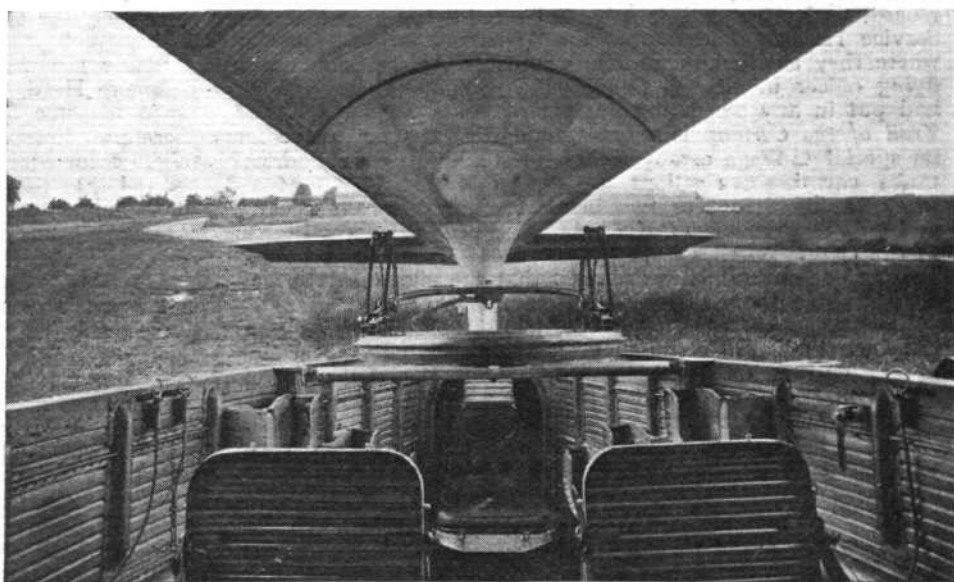
The French authorities have approved a new air mail stamp commemorating the twenty-fifth anniversary of M. Blériot's flight across the English Channel.

Stout "Sky Car"

"Bill" Stout is flying his "Sky Car" almost daily, and is reported to land crossways of the 60 ft. runways at Dearborn Airport. An improved version is under construction which is expected to have a performance about 30 per cent. better than that of the present model and to carry three people.

Hot Air?

A report in a daily paper states that a Frenchman has invented a flying machine wherein hot air at 1,200 deg. F. is sent coursing through little wings, creating a vacuum, lifting the machine and pulling it forward. It will weigh but 352 lb., will carry a load of 538 lb., and will consume about 5 gall. of petrol per 120 miles. Its climb to 1,000 metres takes only 7 min., and its landing speed is nil. It consists only of a fuselage bespattered with "tiny wings." It sounds just what the doctor ordered—with a hot water bottle to take the pain out of flying!—but you never know!



THE "RUBBERNECK" OF THE FUTURE? This "interior" view (looking towards the tail) of the Nieuport-Delage 590 Col. 3, General Purpose Colonial monoplane, in which the aft portion of the cabin is left open, suggests a possible use for this form of arrangement for aerial sight-seeing *chars-a-banc*. The all-round view thus obtained would be excellent.

Diary of Forthcoming Events

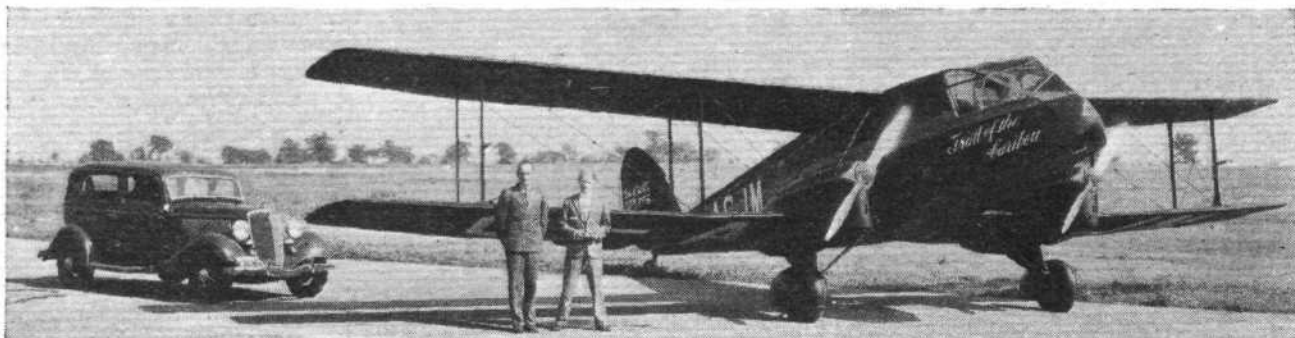
Club Secretaries and others are invited to send particulars of important fixtures for inclusion in this list:

- Aug. 17-Sept. 6. Copenhagen Aero Show.
- Aug. 18. Cotswold Aero Club Air Rally and Garden Party.
- Aug. 25. Liverpool and District Ae.C. Garden Party, Speke Aerodrome.
- Aug. 28-Sept. 16. International Touring Competition, Poland.
- Sept. 1-2. Cinque Ports Flying Club International Rally, Lympne.
- Sept. 1-9. National Soaring Competition, Sutton Bank.

- Sept. 1. Opening of Newtownards Aerodrome, Belfast.
- Sept. 29. Leicestershire Aero Club "At Home."
- Oct. 6. London to Cardiff Air Race and Cardiff Ae.C. Garden Party.
- Oct. 7. Aviation Golf Meeting, Royal Porthcawl Golf Club, Porthcawl.
- Oct. 20. England-Australia Race for MacRobertson Prize.
- Nov. 16-Dec. 2. 14th International Aviation Exhibition, Grand Palais des Champs-Elysees Paris.

NON-STOP FROM CANADA TO ENGLAND

A Standard D.H. "Dragon" with Special Tanks Flies 3,700 Miles in less than 31 Hours on a Long-distance Record Attempt



IN CANADA: *The Trail of the Caribou* photographed before the start of the flight with her two pilots, L. G. Reid and J. R. Ayling.

AT six o'clock last Thursday afternoon a D.H. "Dragon" landed almost unheralded at Heston. Flown by J. R. Ayling and L. G. Reid, this already famous machine had made the first non-stop flight between Canada and England, and had covered some 3,700 miles in 30 hr. 50 min. Only bad luck with weather had made it impossible for them to carry on in the hope of reaching Baghdad, their objective, and thus beat the non-stop record of 5,657 miles set up by Codos and Rossi over much the same route.

Early this year, Ayling and Reid had purchased the Mollisons' *Seafarer* and renamed it *The Trail of the Caribou*, with the idea of making a purely private attack on the long-distance record, and, after taking a special blind-flying course at Air Service Training, had shipped the "Dragon" over to Canada, where they awaited favourable weather. Ayling had been a flying officer in No. 36 Squadron at Singapore, but neither had put in any staggering number of hours' flying, and *The Trail of the Caribou* is a very standard "Dragon" save for its special tankage arrangements. Actually, three cylindrical tanks, carrying 612 gallons, are slung and braced in the fuselage, leaving a foot or two below for access to the cockpit and for the arrangement of a light camp bed; the normal tanks in the engine nacelles have been replaced by special oil reservoirs. The cockpit is so arranged that the pilot on duty may be relieved without difficulty.

Wasaga Beach, from which the pilots took off at 5.10 a.m. (Toronto time) on Wednesday, is a narrow, curving stretch of sand on the south-west shore of Georgian Bay, Lake Huron, and about three miles in length. With a slight cross wind—that is, in a flat calm to all intents and purposes—the "Dragon," loaded to 7,300 lb. (more than 3,000 lb. overload), took off in 1,600 yards at an air speed of approximately 90 m.p.h.

The pilots followed the St. Lawrence River and left land at Belle Isle, north of Newfoundland. Some five hours later they ran into rain and really thick weather. Ayling, who was flying the machine at the time, told us that the conditions were much worse than any he had experienced in the East, and that the fog, which extended down to the water, was covered by a bank of cloud. For six hours, taking turns at the controls, they flew absolutely blind and in darkness, and it was while attempting to climb through the clouds on full

throttle that the trouble which caused the machine to be prematurely grounded began.

Ayling found that the throttle operation was becoming erratic, and afraid that, if moved, the throttles might become immovable in a half-closed position, the pilots flew more or less at full throttle during the whole period. Furthermore, blind flying in rough weather is full-time work without the necessity for fidgeting with throttle positions and the study of revolution counters. Consumption had been calculated at 10 gallons to the hour with a progressive reduction, as the load diminished, to about 8 gallons an hour. At full throttle the engines were using more than 16 gallons an hour, and, thereafter, the chance of reaching Baghdad did not appear to be too good.

Before the machine crossed the west coast of Ireland at Dunmore Head, they had decided against the risk of putting down in some corner of Europe or Asia Minor, and made, therefore, directly for London. The trouble, they thought, might occur again during the next night. Later measurement showed that the tanks still held 198 gallons of fuel, and this, at a progressively lower consumption, should have taken the "Dragon" beyond Baghdad and the record distance under reasonable conditions.

Actually, the carburation system had been arranged for an engine speed of 2,150 r.p.m., at which its temperature could not possibly have dropped below 35 deg. Centigrade, and the trouble must be directly attributed to the fact that it was still found impossible to reduce the engine speed below 2,175 r.p.m. and maintain height. In order to guard against freezing, inside air intakes, fitted with flame traps, were interconnected with the throttles, so that at the tested cruising revolutions, hot air was supplied to the carburettors, the forward facing intakes being automatically shut off. The pilots, therefore, did not associate the trouble immediately with freezing, and the throttles were opened still farther to maintain height, thereby introducing more cold air.

When we examined the machine at Hatfield on the following day it had not been touched, and both engines and cowlings were as clean as if the "Dragon" had just left the erecting shop.

Reid and Ayling hope to make another attempt next summer.

Karachi Aerodrome Developments

Karachi Airport will present quite a different picture in a couple of years' time when the present programme is completed.

The Customs House is the most important building, and this at present is small and unimposing, consisting of a few rooms. On its roof is the aerial lighthouse, which is the latest night landing unit for aircraft. All who have visited the aerodrome have realised the necessity for expanding the present accommodation, and the visit of Mr. Tymms, the Director of Civil Aviation, a few months ago was prominently connected with the changes to be made.

It is now understood that, as the necessary sanction has been obtained from the Government, one large and spacious building, with two, or possibly three, floors, will be constructed, in which provision will be made for a separate Post and Telegraph Department, a wireless station control room, separate offices for both Imperial Airways and the various air lines, as well as rooms for visitors and for the aerodrome officers.

There will thus be greater co-operation and co-ordination in the work, and this will result in economies. The ground floor of the building will be utilised primarily for the office premises, while the first and second floors, it is understood, will be leased to a concern to be run as an up-to-date hotel.

COMMERCIAL AVIATION

— AIRLINES — AIRPORTS —

CONSIDER THE PASSENGER

If a passenger is expected to use the air for more than merely urgent business he must be made at least as comfortable, in both mind and body, as he is when using surface transport. The customer's judgment, in fact, is final

IN air-line operation comfort must be considered as soon as safety, regularity, and speed have been assured.

Now, comfort does not necessarily mean saddleback armchairs and stewards, though such things are all very well in their place. Comfort on an internal air route should be up to the standard of that on a first-class motor coach, so far as seating and internal decoration are concerned, and is usually so provided by the manufacturer when the machines are delivered.

Comfort in flying, however, means very much more than this. Even in a motor car or train much depends on the manner in which the driving is done. In the air bad piloting leads to acute air-sickness, which used to be the bane of air travel between this country and the Continent, but which is now comparatively rare. It is a saying in commercial air circles that an air-sick passenger never returns, and prevents a dozen other people from becoming air travellers.

The matter is, therefore, as the old-established companies realise, worth a little thought. Air-route pilots have been taught to study weather conditions and fly at the most suitable height for smooth travel. They must also fly the machine and not let it fly itself. Climbing turns, sideslip landings, and any other means of making nervous passengers clutch their chairs are also strictly forbidden.

Some time is taken in training a pilot, especially one from the R.A.F. or with long experience as an amateur, to fly with a sympathetic understanding of the feelings of his passengers, for every quiver of the machine may produce qualms in the cabin.

Travellers with experience of cross-Channel flying say that some pilots on internal liners are not all that they should be from this point of view. This is curious, for the matter is much more serious on internal lines. Seasickness is usually more feared than air-sickness, and air travel is, therefore, preferred, even in very rough weather. Unless operators tackle this problem, their passengers may desert them for the train except in the finest weather.

Then there is the question of smoking in aeroplanes.

Some new lines announce with pride that it is allowed in their machines. It is a facility which will be much appreciated by smokers—in fair weather. But the reason why smoking is not allowed on the older air routes has little or nothing to do with danger. It is the same reason which causes railway companies to segregate smokers—consideration for one section of the travelling public at the expense of a trifling sacrifice on the part of another section. In air travel—and especially where small machines are used—smoking will certainly increase air-sickness amongst non-smokers, women and children. So experienced air-line operators will only permit it when separate accommodation can be given to smokers.

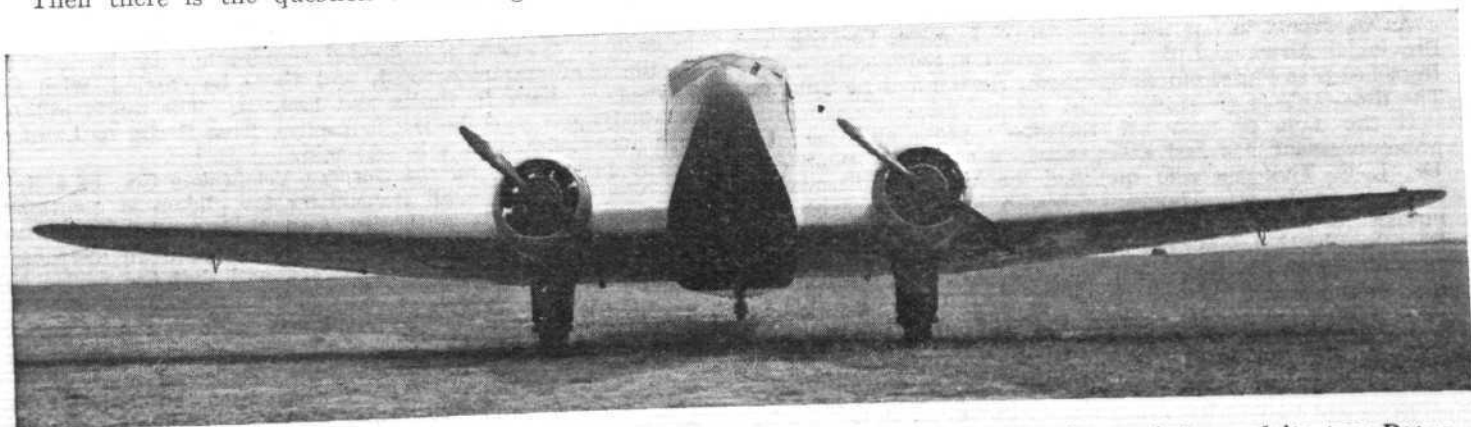
On American air lines, incidentally, where smoking is permitted, strict supervision is exercised, and only cigarettes are allowed. This is a wise ruling.

Another aspect of the smoking question may be mentioned. A traveller told me that on one line in this country everybody smoked in the cabin, but no supervision was exercised. He spent a very uncomfortable hour or so watching people tap hot ash off their cigarettes on to odd newspapers. There is such a thing as mental discomfort!

Small matters making for the comfort or convenience of passengers must not be neglected. In noisy machines, for instance, cotton-wool should be provided. Maps of the route, too, greatly enhance the enjoyment of the trip. Again, the brisk attention of a uniformed official at arrival or departure tends to give confidence in the efficiency of a line. Small points, perhaps, but important. There should not be a suggestion of the slipshod at any time.

No doubt the "rough edges" sometimes to be seen will be smoothed away in due course, and too much must not be expected at first. So long as air-line promoters realise that their organisation is never so superb that it cannot be improved upon, all will be well.

It is not, after all, to "expert critics" that the air-line people must reply, but to the traveller with experience of the old-established routes. He gives final judgment, and the passenger's word is law. "RICHARD CARVETH."



A FRENCH FEEDER LINE MACHINE: The new Potez 56 has a retractable undercarriage, and its two Potez radial engines are supercharged. Six passengers are carried. Its resemblance to the Airspeed "Envoy" is quite marked.

Commercial Aviation**CROYDON***Passports Before Baggage : Routine Atlantic Crossings : Spartan Air Lines Busy : Educating Their Elders*

THERE are signs that the authorities at Croydon are thinking quite seriously about making the necessary structural alterations to allow passengers' passports to be examined before luggage is cleared through Customs.

It must be two years or more since the operating companies unanimously decided that this change was necessary and since the Air Ministry agreed to do it. A prominent works and buildings official has been seen to be busily measuring the place where the alterations are to take place—with his eye. At an aerodrome run by private enterprise the work would have been put in hand about a week after the decision had been taken. There are just three departments of the Air Ministry in which the companies place their faith—Meteorological, Wireless, and Traffic.

To the last of these departments we have to welcome Sqd. Ldr. Spence, who recently joined the Control Tower staff. There are rumours that this may mean a change at another Government airport, but there is no official news yet.

Lord Willingdon, Viceroy of India, and the Countess of Willingdon left Croydon for India by Imperial Airways, Ltd., after two months in England, and a day or so previously Mr. Neville Vintcent, the Viceroy's personal pilot, arrived from India by K.L.M.

Amongst the routine messages received by the Control Tower from Heston the other day were two which arrived simultaneously: "G-E (—) left (—) for Le Touquet, pilot (—)," and, "G-ACJM arrived Heston from America, pilot Reid." Strictly speaking, the information "not returning to-day" should have been added.

One day last week Spartan Air Lines, Ltd., operating for Railway Air Services, Ltd., made no less than 32 arrivals and departures at Croydon on the Isle of Wight service. This particular line passes over the village in which I live—and is

the only one to do so. In view of the nonsense talked and written about aeroplanes "making life unbearable," I made some local enquiries. Nobody minded the machines in the least, and the nearest approach to a complaint was the remark of one old gentleman who said that an aeroplane overhead was no worse than a bee near your ear; which shows that a lot of people have nothing to do but grumble.

A remarkably self-possessed air traveller arrived from Zurich all alone the other day; a little boy aged 10. He showed his passport, assured the Customs people he had no contraband about him, and then requested the Imperial Airways steward to fetch him an unconsumed portion of cake he had left in the machine. Afterwards he made stern enquiries after his overcoat, and, when this was produced, insisted on verifying the fact that his luggage was really in the coach. When last seen he was on the way to Airways Terminus, where he was to be met, while completing his interrupted meal of cake. Children never mind air travel; it is only some of their more timorous elders who are scared. The other day, too, an Imperial Airways official's two children left Croydon for Bridlington with Capt. Crundall, of Air Taxis, Ltd., who was making a newspaper trip. The parents left by car a full half hour before the machine and made very fast time up the Great North Road. But the children had breakfasted, sailed, tried all the automatic machines in the place, and were becoming bored by the time the family arrived, at about 1.45 p.m.

One of the Sunday papers gave a graphic account of the way in which the new Autogiro, which "can be housed in a garage," will revolutionise air travel for the millions. Something of the sort, one supposes, is bound to come. One thing is very certain; privately owned aeroplanes must not fly on or across the regular air routes, except in good weather—otherwise there will be trouble.

A. VIATOR.

HESTON*Ards Airport Opening : The Leeds-Le Touquet-Paris Service : A Birkett Pilot in Europe's Cauldron : Wireless Instruction : Treasure Trove*

THE Ards Airport, Newtownards, the first civil aerodrome in Northern Ireland, is to be officially opened at 2.30 p.m. on Friday, August 31. A luncheon, to which private owners and others are invited, is to be given by Lord Londonderry at 1.30 p.m., and a flying programme has been arranged for the afternoon. Visitors are invited to stay and witness the International Tourist Trophy Race on the following day—the western boundary of the aerodrome adjoins the fastest part of the famous circuit. The complete flying programme will be announced later, but will certainly include inverted flying by Mr. W. Thorn, who is in charge of the Manchester depôts of both Henlys, Ltd., and Birkett Air Service, Ltd., on an Avro "Tutor." Hillman's Airways will also be carrying out joy-riding with three D.H. "Dragons," and the new aircraft to be demonstrated will include the C.30 Autogiro and the Avro "Commodore."

As we stated in our news last week, London, Scottish and Provincial Airways, Ltd., have opened a twice-daily service from Leeds to Paris, via Nottingham, Heston and Le Touquet. The time-table is given elsewhere.

If the days of man are threescore years and ten, this pronouncement has had little effect on our older pupils, for Dr. J. E. Thomson who qualified for his "A" licence last week is 69½! Dr. Thomson, though immensely keen, was unsatisfied with his progress at two flying clubs in the Far East, and he therefore came to Heston to complete his training. In so doing he has won a bet with the Sultan of Johore, who, though ten years his junior, denied that it was possible for persons of riper years to master the subtleties of flying.

The Austrian business provided a tempting opportunity for press photographers lucky enough to get through the official barriers. Mr. L. Stace, of Birkett Air Service, helped two of these to success by some very fine flying in a Percival "Gull." The party of three took off at 4.30 a.m. on July 28 and reached Vienna in time for lunch, in spite of the delay involved in sealing the cameras while over Germany. Photo-

graphs were obtained and given to Mr. Stace, with instructions to fly them back to Berlin to catch the mail machine to London. Soon after passing over Prague the clouds came down on the high land around the Elbe, and Mr. Stace, hugging the treetops, flew on in a torrential downpour. Just past Dresden darkness came on, and he reached Berlin at 9.30 to find that the night mail had been cancelled owing to the weather. Birkett's part of the contract was, however, fulfilled, and Mr. Stace returned to Vienna the next day. Three days later, as the party were preparing to return to England, the death of Hindenburg altered their plans, and they flew 600 miles through the Polish Corridor to Marienburg, the nearest aerodrome to the President's home, most of the journey being covered without a map. Photographs of the lying-in-state were flown to Berlin to catch the mail plane to England, and Mr. Stace then proceeded to Allenstein, near Tannenburg, in spite of rumours of a flooded aerodrome. He landed just as the photographs arrived, and these he carried, with the passengers, back to Berlin and London. The day's mileage totalled 1,400, and the last 640 miles, from Berlin to London, was accomplished in 4 hr. 20 min.

The production, by the German Telefunken Co., of a light receiving set and small transmitter for gliders is mentioned in *Interavia*. This authority says that good results have already been achieved in communication between instructors on the ground and pupils in gliders, and that the device will shortly be applied to powered aeroplanes as well. It is worth recalling that such an experiment was made in the early days at Heston, but was abandoned after subsequent experience.

The careers of "pensioned" airwork school machines are well worth watching. "CY" has been entered for the MacRobertson, and "CV" has now passed into the hands of Treasure Recovery, Ltd. Cocos Island treasure is to be the object of their search, in which the resources of modern science will supplement the standard treasure-seeker's equipment of faith, hope and a bump of locality.

CIVIL AVIATION DEVELOPMENT

Suggestions Put Forward by the Civil Aviation Section of the London Chamber of Commerce

THE London Chamber of Commerce, on the recommendation of its Civil Aviation Section, has through the Air Ministry submitted its views on British civil aviation for the consideration of the Government.

The memorandum reiterates its previously published views on the air mail question, which were: (a) Industry definitely required faster services, and that the Air Mail should travel at least 2,500 miles in the 24 hours; (b) All first class Empire mail should be sent by air; (c) A low flat rate of postage should be charged for Empire Air Mails; (d) Service should be more frequent on the Imperial routes; (e) Air Mail contracts should be paid for by the Post Office.

The second part of the memorandum deals with air routes and aerodromes.

It is evident that some properly co-ordinated plan for air route facilities on a national scale is called for, rather than that development should proceed on the haphazard lines of the past few years. The substance of such a plan might be communicated to the local authorities affected, so that each would know what was required of them and have some assurance that the provisions which they were making would be needed.

The Chamber puts forward the following suggestions for consideration:—

(a) That the ground equipment and traffic control of British air routes should be vested in a statutory body on which the Air Ministry, the General Post Office, aircraft operators, insurance and commercial interests, among others, should be represented. This body should be independent of all other organisations and should stand in much the same relation to aviation as Trinity House does to shipping.

(b) That the finances necessary for equipping and maintaining the air routes with wireless, lighting, meteorological and traffic control services should be provided by the Government and administered by this body, which should also arrange for the collection of dues, as in the case of merchant shipping.

(c) That this body should be appointed without delay in order to plan, in consultation with the appropriate authorities, the principal air routes and aerodromes in this country having regard to present and future needs. The publication of this plan, or part of it, would give to those bodies which hesitate to establish aerodromes the needful assurance that a particular type of aerodrome would form part of a definite scheme. It has been suggested that, if further encouragement is needed, His Majesty's Government might in some form give certain financial guarantees for the raising of loans by local authorities for the construction of aerodromes.

A leader on the memorandum appears in this issue.

IN CHINA

A New Company to Operate in the South-west Provinces : Rapid Developments in Manchukuo

FROM *Shell Aviation News* we learn that, in addition to the Chinese National Aviation Corporation, the Eurasian Aviation Corporation, and the Manchurian Aviation Company, a fourth commercial company is to operate in China. The South-West Aviation Company, as it is called, is to carry mail, for the present, between Canton, Kwangsi, Kweichow, and Yunnan, with a connection later to Hainan Island. Three Stinson "Reliant" four-seaters have been purchased.

The C.N.A.C., incidentally, after a very troubled existence, is now owned by Pan-American Airways and the Ministry of Communications. Services are run between Shanghai and Chengtu, Shanghai and Peking, and Shanghai and Canton. Loening amphibians are used on the first route, though six Fairchild flying-boats with two-way radio have been ordered. On the second, Stinson "Detroits" are still in use, but it is reported that two Lockheed "Electras" have been purchased. The third line, to Canton, was inaugurated late in 1933 with Sikorsky S.38 amphibians, but two of these were lost in the bad weather conditions experienced during the

following months, and the service has been suspended pending the arrival of two Consolidated "Commodore" boats.

German Lufthansa interests are at the back of the Eurasian Aviation Corporation, but troubles on the border of Eastern Mongolia have caused the temporary cessation of major operations. As soon as the situation improves in North-West China the E.A.C. propose to open a weekly service from Shanghai to Berlin. At present a bi-weekly line is run between Canton and Peking, Hankow, Loyang, and Taiyuanfu, using Junkers F.13, W.33, and W.34.

The Manchurian Aviation Company, which was founded in 1932, has developed vigorously in the Manchukuo area and is supported strongly by the Japanese military authorities. Actually, between November, 1932, and August, 1933, nearly nine thousand passengers were carried on the ten lines, and 126,000 hours flown. The country is definitely being opened up through the new medium. Three types of machine are used: Fokker F.VII with Wright "Whirlwind" engines, Japanese-built Fokker Nakajima II, and the D.H. "Puss Moth."

K.N.I.L.M. to be R.N.I.A.

Owing to a wish expressed by the Dutch East Indian Government that the term "Dutch East Indies" should be discontinued in favour of "Netherlands India," the Koninklijke Nederlandsch-Indische Luchtvaart Maatschappij (known, for short, as "K.N.I.L.M."), state that they prefer to be known by their correct English name—Royal Netherlands Indian Airways, or R.N.I.A.

Ownership on August 1

Lloyd's and the British Corporation Register give the present ownership figures as follows:—

Private	545
Agents	60
Constructors	124
Clubs	93
Others (non-classified)	3
Business (other than aviation)	37
Aerial Work	4
Taxis, School and Joy-riding	299
Imperial Airways, Limited	38
National Flying Services, Limited	12
Total	1,215

Inland Air Mails

August 20 is given as the date for the inauguration of the new mail service. Special souvenir envelopes are being issued by Railway Air Services, Ltd.

Direction-finding Equipment for Internal Lines

The Air Ministry is to provide direction-finding wireless stations at Portsmouth Airport, Hull (Hedon), Belfast (Newtownards), Glasgow (Renfrew), and provisional arrangements are under consideration for Jersey and Plymouth (Roborough).

Heston has already decided to install apparatus similar to that in use at Croydon.

To the Isle of Wight

During the holiday week it would be expected that the P.S. and I.O.W.A. traffic figures might go up, but the actual figures are rather staggering. Between Portsmouth and the Island a thousand or fifteen hundred passengers are carried in a normal week, but during the week ended August 9 the figure was 3,769.

Actually, on one particular day the number was almost equal to the normal weekly figure—1,019 passengers, to be exact. On three days 85 per cent. of the available seats had been sold. 193 passengers were carried between London and the Island.

Commercial Aviation

Hillman's "Sixes"

The second D.H. "Dragon Six" is now running on Hillman's Airways' Paris service and reducing the time for the journey between Essex Airport and Le Bourget to 1½ hours. Mr. Hillman's "Dragons," incidentally, have flown some 1,200 hours each since they were put into service and are still hard at work.

£675,000 for Indian Developments

Last week the Government of India decided on an expenditure of £675,000, spread over three years, for the development of civil aviation. Night flying equipment will be provided for the trans-Indian route; both Bombay and Madras aerodromes will be lit for the Karachi-Colombo route; and full equipment for these routes and for three new routes—Bombay to Calcutta, Calcutta to Madras, and Karachi to Lahore—will be provided.

African Time-table Alterations

For the benefit of passengers a modified time-table was put into operation at Cairo on August 1. The north and west-bound Imperial Airways machines will leave the Nile on Tuesdays and Saturdays at 4.15 L.S.T.—a quarter of an hour earlier than before. This alteration will allow a greater margin of time between the arrival of the flying boat at Brindisi and the departure of the train. The south and eastbound services will leave Heliopolis on Saturdays and Tuesdays at 5.00 L.S.T. and 5.30 respectively, instead of 3.00 as before.

Across the Sahara

While a monthly French experimental flight to Brazzaville, in the Congo, is being run, we learn that S.A.B.E.N.A. are to start a fortnightly service from Brussels to join that company's present services in the Congo. For a start, only mail will be carried, and single machines, carrying a crew of four, will make the entire journey in long stages through Marseilles, Oran, Gao, Dua, and Leopoldville.

The R.A.S. Glasgow Service

Provisional departure times for the Railway Air Services Belfast and Glasgow line, which is to start next Monday, are as follows:—

Read Down.		Read Up.
3.10 p.m.	London	1.30 (arr.) p.m.
4.10 "	Birmingham	12.40 a.m.
4.55 "	Manchester	11.55 "
5.45 "	Isle of Man	11.05 "
6.40 "	Belfast	10.20 "
7.30 (arr.) p.m.	Glasgow	9.15 "

D.H.86's will be used, but, owing to the fact that Castle-town aerodrome is not considered suitable for such a machine, a supplementary connecting service, between Manchester, the Isle of Man, and Belfast, will be run, with D.H. "Dragons."

Walsall Aerodrome

The Town Council of Walsall have decided to postpone the official opening of their aerodrome until next year in order to give the surface time to consolidate. Flying, of course, goes on as usual.

Hooton's Future

The Cheshire County Council has been recommended to co-operate with Birkenhead Corporation and the Bebington and Ellesmere Port Councils in acquiring the lease of the Hooton aerodrome. An offer has been made by Messrs. Lever Bros. to subscribe £100 a year for three years, if the councils concerned will do the same, in order to preserve the site as an aerodrome.

In Malaya

The long-delayed aerodrome for Ipoh will, when it is completed, be only one among twenty such stations that the authorities hope to establish in Malaya during the course of the next two years. It is believed that when the Assam Kumbang aerodrome, Taiping, has been further developed it will rank among the finest in the Far East. The programme during the next two years will give Perak four aerodromes—Ipoh, Taiping, Teluk Anson and Sitiawan. This aerodrome chain is to be provided by the R.A.F. at Singapore in co-operation with the civil and government authorities, and the more important aerodromes will be those at Singapore, Malacca, Port Swettenham, and/or Kuala Lumpur, Sitiawan, Taiping, Penang, and Alor Star. Intermediate "spots" have been earmarked.

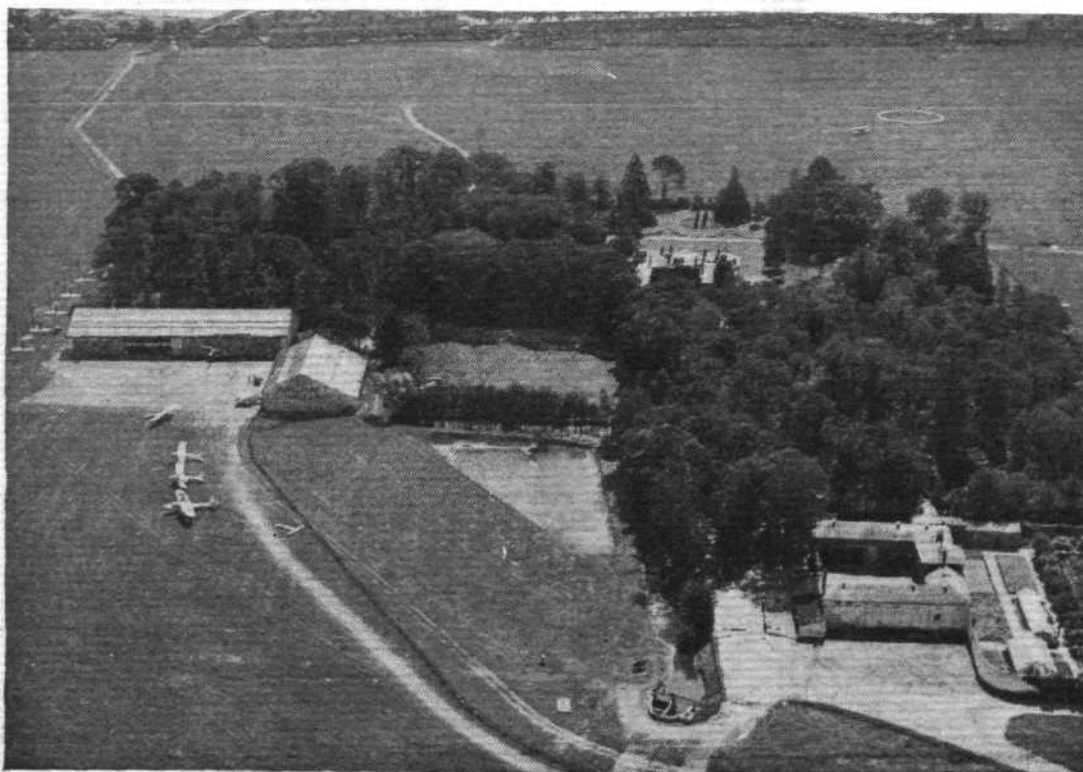
The Leeds-Paris Service

The time-table for the twice-daily service between Leeds (Sherburn - in - Elmet), Nottingham (Tollerton), London (Heston) and Paris (Le Bourget), operated by London, Scottish and Provincial Airways, Ltd., has now been issued. Passengers will be landed and picked up at Berck Aerodrome for Le Touquet by special arrangement, and the following departure times will apply, subject to alteration, for the months of August and September:—

READ DOWN.		READ UP.	
10.00 a.m.	3.00 p.m.	LEEDS	1.20 p.m. (arr.) 6.20 p.m. (arr.)
10.40 a.m.	3.40 p.m.	NOTTINGHAM	12.50 p.m. 5.50 p.m.
11.55 a.m.	4.55 p.m.	LONDON	11.45 a.m. 4.45 p.m.
1.50 p.m. (arr.)	6.50 p.m. (arr.)	PARIS	9.30 a.m. 2.30 p.m.

The single fares range between £1 rs. (Leeds-Nottingham) to £5 5s. (Nottingham-Paris), and a small charge is made for luggage in excess of 22 lb. Booking agents at Leeds and Nottingham are R. Barr (Leeds), Ltd. (Leeds 21704), and Richardson's Car Park (Nottingham 3393) respectively, with M. Maurice Finat (135 Le Bourget) in Paris.

At Heston, of course, there are connections to both Jersey and the Isle of Wight. Airspeed "Couriers" will be used until the "Envoys" are put into service.



HANWORTH SAVED: The British Pacific Trust, who purchased Hanworth aerodrome last week, state that it is to remain an aerodrome. This rather unusual view, taken from a C.30 Autogiro, shows the N.F.S. clubhouse, and some of the "industrial" area; the British Klemm buildings and the N.F.S. workshops are in the very near—and out of sight—foreground.

RECENT BOOKS

PILOT'S "A" LICENCE

Mr. John Leeming has revised his small book, and this, the sixth edition, is invaluable for those who wish to take their "A" pilot's licence. A section in the book deals with travel abroad, and the whole make-up is such that, while all redundant matter has been omitted, nothing has been left out which embryo pilots will want to know. (Pitman—3s. 6d.)

FLYING FOR NEWS

A breezily written book which describes the adventures of one, Larry Rue, who uses a "Moth" in the course of his work as foreign correspondent for an American paper, in the Mediterranean district. Published by John Hamilton—10s. 6d., it is just the sort of book of solid aeronautical interest which is light enough to while away odd moments.

AIR LICENCES

A small volume (3s. 6d. net. Pitman) by T. Stanhope Sprigg which gives full details of all the licences and certificates of competency which are required by those engaged in civil aviation. Mr. Sprigg is to be congratulated on collecting so much valuable material into one compact volume; material which is, of course, available in various Air Ministry publications, but which requires a good deal of searching for.

A YEAR BOOK

Sqd. Ldr. C. G. Burge edits the Airman's Year Book (Pitman—3s. 6d.), a compendium of information which will be of value for reference. It deals within its comparatively small compass with a very wide range of subjects, including matters like customs, meteorological, air records, air touring information, aircraft markings, aviation law, the Air Navigation Order, and Air Navigation Directions.

BRITISH AIRWAYS

An addition to the Discovery Books (published by T. Nelson and Sons at 2s. 6d.), by C. St. John Sprigg. It should be particularly attractive to younger readers who want to know all about our airways, not only those being operated in this country itself, but also on our great Empire services to the Cape and Singapore.

AERODYNAMIC THEORY

Published by Julius Springer, Berlin, at Rm. 20, this is the first volume of a series of six forming a general review of the progress in the world of aerodynamics, and was compiled under a grant of the Guggenheim Fund for the promotion of Aeronautics. This book is a collection of monographs by well-known experts from all over the world under the General Editorship of W. F. Durand. It deals mainly with special mathematics and fluid mechanics.

THE MATERIAL OF AIRCRAFT CONSTRUCTION

Mr. F. T. Hill has in this volume collected together a wealth of material which should prove invaluable to those whose work brings them into constant and close contact with aeroplanes in their various stages of manufacture. It is comparatively large (Pitman—20s.), but is unusually comprehensive, and includes information of the strength and specification of all types of material from steel to fabric. It is not a book which designers or aircraft engineers can afford to do without.

GROUND ENGINEERING

Pitman's series dealing with Ground Engineers' Licences comprises four volumes. "The Rigging Maintenance and Inspection of Aircraft," by W. J. C. Speller, covers the "A" licence, and is published at 5s. "Inspection of Aircraft after Overhaul," by S. J. Norton, deals with the "B" licence, and is 3s. 6d. net. "Aero-Engines," by Barlow, Barrett and McIsaac, dealing with the "C" and "D" licences, is also 3s. 6d. net. "Instruments," by R. W. Sloley, at 5s., deals with the testing and overhauling of aircraft and aero-engine instruments, and should be of great value to the engineer preparing for his examination in category "X." These four books are recognised by the Air Ministry as volumes which should prove of value to intending applicants for Ground Engineers' licences. These licences are primarily issued for practical knowledge, and the subjects they cover can never be fully dealt with in books. No amount of reading can replace practice, and it must not be thought that a licence could be obtained by reading alone. Nevertheless, in so far as is possible these volumes will certainly be very helpful.

THE STORY OF PETROL

In this volume (T. Nelson & Sons—3s. 6d.) Mr. C. Webber tells the story of petroleum spirit from the beginning to the end. He describes in language easily understood by the younger generation how anticlines are found, how wells are drilled and tapped, how the crude oil is refined, and finally how the resulting spirit is utilised in internal combustion engines.

PLANES OF THE GREAT WAR

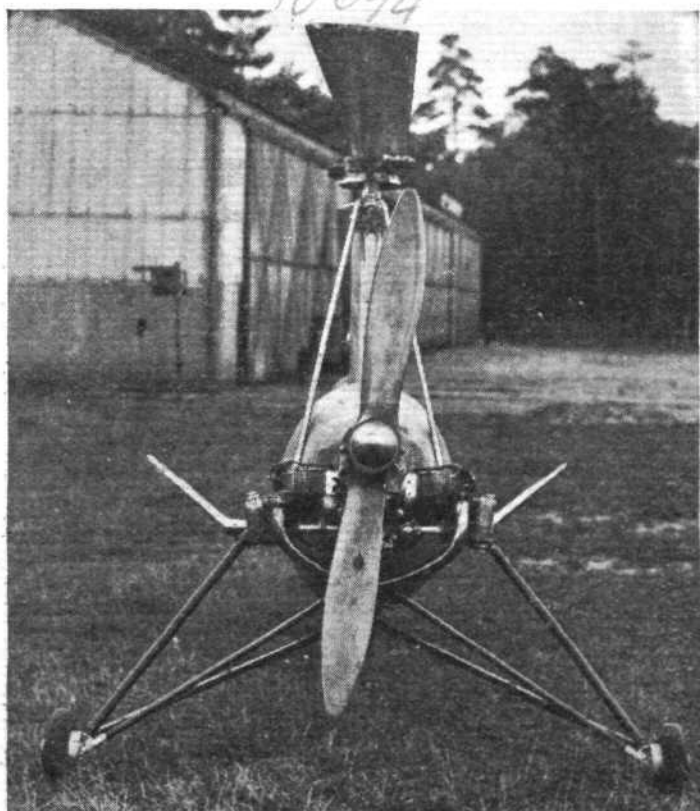
An interesting collection of illustrations of many of the best-known aeroplanes and seaplanes used during the war by the British, French and German Nations. Mr. Howard Leigh's prints are reproduced by the collotype process, making the book fairly expensive (John Hamilton—7s. 6d.), but in this form it certainly is an attractive record. Each print is accompanied by text explaining its salient details.

THROUGH RUSSIA BY AIR

In *Flight* of November 10, 1932, we published an account by Mr. John Grierson of his trip through Russia to Samarkand and back. This account has, in the volume under review (Foulis—5s.), been enlarged, and in book form makes excellent reading. Mr. Grierson went through many vicissitudes before he brought his adventurous journey to a successful conclusion, and his experiences will make many a pilot wish to follow in his footsteps. At the present time he is exploring the Arctic Air Route to Canada via Greenland, but in a new "Fox Moth," not the well-tried "Moth" used for his Russian adventure.

AN INTRODUCTION TO AERONAUTICAL ENGINEERING

The first volume of this series, "Mechanics of Flight" by A. C. Kermode (Pitman—8s. 6d.), has now been published in its second edition, and embodies the results of the criticism the author has received after the issue of his first edition. Like the other volume in the series, it is designed to appeal to those engaged in aviation who wish to have more than a cursory knowledge of aerodynamics, and is particularly suitable for draughtsmen, students, etc. The second volume is "Structures" by J. D. Haddon (Pitman—6s.), also now issued in a second edition. Several sections have been extended, and a new one added, that on Undercarriage Strength.



UNORTHODOXY: The small single-seater Autogiro experimental model which, when the trials have been completed, is to be put on the market by G. and J. Weir, Ltd.

The WORLD'S AVIATION RECORDS



BELOW we publish a list, issued by the Fédération Aéronautique Internationale, of the Official World's Aviation records, as standing on July 1, 1934. It will be noticed that *not a single record* stands to the credit of Great Britain.

CLASS C (POWER-DRIVEN AEROPLANES)

Distance in Straight Line.—9 104,700 km (5,657.6 miles). France, Rossi and Codos, on Blériot monoplane, 550 h.p. Hispano-Suiza, Floyd Bennett Field-Rayack, August 5-7, 1933.

Altitude.—14 433 m. (47,354.6 ft.). Italy, R. Donati, on Caproni monoplane, 600 h.p. "Pegasus," Rome, April 11, 1934.

Speed, Ground Level, 3 km.—490,800 km/hr (304.9 m.p.h.). U.S.A., J. R. Wedell, on Wedell-Williams monoplane, Chicago, September 4, 1933.

100 km (62.14 miles).—428,138 km/hr (266.04 m.p.h.). U.S.A., J. R. Wedell, on Wedell-Williams monoplane, 800 h.p. Pratt and Whitney "Wasp Junior," New Orleans, February 17, 1934.

1 000 km (621.4 miles).—358,159 km/hr (222.56 m.p.h.). France, M. Massotte, on Caudron 366, 200 h.p. Régulier, Istres, January 7, 1934.

2 000 km (1,242.8 miles).—345,310 km/hr (214.57 m.p.h.). Germany, R. Untucht, on Heinkel 70 monoplane, 630 h.p. B.M.W., Berlin-Staaken, March 24, 1933.

5 000 km (3,107 miles).—208,152 km/hr (129.34 m.p.h.). Spain, Carlos de Haya Gonzales and Cipriano R. Diaz, on Breguet, 600 h.p. Hispano-Suiza, Seville-Utrera-Carmona, October 7-8, 1930.

10 000 km (6,214 miles).—149,853 km/hr (93.11 m.p.h.). France, J. Le Brix and M. Doret, on Dewoitine monoplane, 650 h.p. Hispano-Suiza, Istres, June 7-10, 1931.

Records with 500 kg (1,102 lb.) Useful Load

Altitude.—10 285 m (33,744 ft.). France, Signerin, on Breguet 198, 620 h.p. Gnome-Rhône, Villacoublay, September 21, 1932.

Speed, 1 000 km (621.4 miles).—347,477 km/hr (215.9 m.p.h.). Germany, R. Untucht, on Heinkel 70 monoplane, 630 h.p. B.M.W., Berlin, March 22, 1933.

2 000 km (1,242.8 miles).—255,253 km/hr (158.6 m.p.h.). France, Doret, Terrasson and Lecarme, on Dewoitine monoplane, (3) 575 h.p. Hispano-Suiza, Villacoublay-Orleans, September 7, 1933.

Records with 1 000 kg (2,205 lb.) Useful Load

Altitude.—8 980 m (29,464 ft.). France, Signerin on Breguet 197, 620 h.p. Gnome-Rhône, Villacoublay, September 23, 1932.

Speed, 1 000 km (621.4 miles).—281,250 km/hr (174.7 m.p.h.). France, M. Lemoine, on Potez 50, 700 h.p. Gnome-Rhône, Villacoublay-Angers, March 8, 1933.

2 000 km (1,242.8 miles).—225,253 km/hr (139.9 m.p.h.). France, Doret, Terrasson and Lecarme, on Dewoitine monoplane, (3) 575 h.p. Hispano-Suiza, Villacoublay-Orleans, September 7, 1933.

Records with 2 000 kg (4,410 lb.) Useful Load

Altitude.—8 438 m (27,685 ft.). Italy, N. di Mauro and G. Olivari, on Savoia-Marchetti 72, (3) 525 h.p. "Pegasus S.2," Montecelio-Rome, May 12, 1934.

Speed, 1 000 km (621.4 miles).—259,556 km/hr (161.28 m.p.h.). France, Doret, Terrasson and Lecarme, on Dewoitine monoplane, (3) 575 h.p. Hispano-Suiza, Villacoublay-Orleans, September 7, 1933.

2 000 km (1,242.8 miles).—255,253 km/hr (158.6 m.p.h.). France, as above.

Records with 5 000 kg (11,025 lb.) Useful Load

Altitude.—6 272 m (20,578 ft.). Italy, Angelo Tivegna and Augusto Kormpai, on Savoia-Marchetti S.72, (3) 525 h.p. "Pegasus S.2," Montecelio, June 15, 1934.

Records with 10 000 kg (22,050 lb.) Useful Load

Altitude.—3 231 m (10,600.9 ft.). Italy, D. Antonini, on Caproni Ca 90, (6) 1,000 h.p. Isotta-Fraschini Asso, February 22, 1930.

Greatest Load to Ceiling of 2 000 m (6,560 ft.)

10 000 kg (22,050 lb.).—Italy, D. Antonini, on Caproni Ca 90, (6) 1,000 h.p. Isotta-Fraschini Asso, February 22, 1930.

LIGHT PLANES

Category 1. Two-seaters not exceeding 560 kg

Distance in Straight Line.—2 912 km (1,809.5 miles). France, Lalouette and de Permangle, on Farman 231 monoplane, 95 h.p. Renault, Istres-Villa Cioneros, January 11-12, 1931.

Altitude.—9 282 m (30,464 ft.). Italy, Renato Donati and Lanciani, on Fiat AS.1, 160 h.p. C.N.A.C-7, Littorio, December 30, 1932.

Speed, 100 km (62.14 miles).—292,018 km/hr (181.4 m.p.h.). France, Delmotte, on Caudron C.430 monoplane, 120 h.p. Renault-Bengali, Villesauvage-La Marmogne, March 30, 1934.

1 000 km (621.4 miles).—225,705 km/hr (140.25 m.p.h.). France, Arnoux and Barbant, on Farman 357, 120 h.p. Renault, Villesauvage-La Marmogne, October 14, 1933.

Category 2. Single-seaters not exceeding 450 kg

Distance in Straight Line.—3 582 km (2,225.8 miles). Poland, Skarzynski, on R.W.D.5 bis. monoplane, 130 h.p. "Gipsy Major," St. Louis, Senegal-Maceio, Brazil, May 7, 1933.

Altitude.—10 008 m (32,836 ft.). Italy, Furio Niclot, on E.T.A., C.N.A., 160 h.p. C.N.A.C-7, Littorio, December 24, 1933.

Speed, 100 km (62.14 miles).—336,530 km/hr (209.1 m.p.h.). U.S.A., L. S. Miles, on "Miles Special," 185 h.p. Menasco C-4-S., Miami, Fla., January 17, 1934.

1 000 km (621.4 miles).—332,883 km/hr (206.8 m.p.h.). France, Delmotte, on Caudron 362 monoplane, 150 h.p. Renault-Bengali, Istres, December 26, 1933.

Category 3. Multi-seaters not exceeding 280 kg

Distance in Straight Line.—886,677 km (550.9 miles). Italy, S. Bedendo and P. Nuvoli, on N.S., 75 h.p. Pobjoy.

Altitude.—6 951 m (22,807 ft.). Italy, G. Zappetta and R. Francesco, on N5 monoplane, 75 h.p. Pobjoy, Montecelio, December 2, 1933.

Speed, 100 km (62.14 miles).—212,139 km/hr (131.8 m.p.h.). France, Bailly and Reginensi, on Farman 239, 75 h.p. Pobjoy, Villesauvage-La Marmogne, October 4, 1933.

500 km (310.7 miles).—200,271 km/hr (124.4 m.p.h.). France, Bailly and Reginensi, on Farman 239, 75 h.p. Pobjoy, Villesauvage-La Marmogne, October 6, 1933.

1 000 km (621.4 miles).—195,760 km/hr (121.6 m.p.h.). France. As above.

Category 4. Single-seaters not exceeding 200 kg

Distance in Straight Line.—852,100 km (529.5 miles). France, G. Fauvel, on Mauboussin-Peyret 10, 34 h.p. A.B.C. "Scorpion," St. Ingelvert-Pau, September 10, 1929.

Altitude.—5 193 m (17,038 ft.). France, G. Fauvel, on Mauboussin-Peyret 10, A.B.C. "Scorpion," Le Bourget, September 5, 1929.

Speed, 100 km (62.14 miles).—221,307 km/hr (137.5 m.p.h.). U.S.A., S. J. Wittman, on "Wittman-Pobjoy Special," 75 h.p. Pobjoy, New Orleans, February 14, 1934.

CLASS Cbis. (SEAPLANES)

Distance in Straight Line.—3 860,823 km (2,399 miles).—U.S.A.,

Knefler McGinnis, M. A. Mitscher, T. P. Wilkinson, C. S. Bolka, and G. C. Eddy, on 10-P-1, (2) 650 h.p. Wright "Cyclone," San Francisco-Oahu, Hawaii, January 10-11, 1934.

Distance in Broken Line.—3 793,200 km (2,357 miles). France, Bonnot and Jeanpierre, on Latécoère 300, (4) 650 h.p. Hispano-Suiza, Berre-Port Etienne-St. Louis, Senegal, December 31, 1933—January 1, 1934.

Altitude.—11 753 m (38,561 ft.). U.S.A., A. Soucek, on Wright Apache, 425 h.p. Pratt and Whitney, Washington, June 4, 1929.

Speed, Ground Level.—682,078 km/hr (423.8 m.p.h.). Italy, F. Agello, on Macchi C.72, Fiat A.S.6, Desenzano, April 10, 1933.

100 km (62.14 miles).—629,370 km/hr (391.09 m.p.h.). Italy, G. Cassinelli, on Macchi C.72, 2,400 h.p. Fiat A.S.6, Falconara-Pesaro, October 8, 1933.

1 000 km (621.4 miles).—222,277 km/hr (138.1 m.p.h.). Germany, R. Starke, Heinkel H.E.9, 600 h.p. B.M.W. VI., Warnemünde, June 10, 1929.

2 000 km (1,242.8 miles).—185,931 km/hr (115.5 m.p.h.). France, Paris and Hébert, on Latécoère 28, 650 h.p. Hispano-Suiza, St. Laurent de Salanque, June 21, 1930.

5 000 km (3,107 miles).—139,567 km/hr (86.7 m.p.h.). France, Paris and Gonord, on Latécoère 28.3, 600 h.p. Hispano-Suiza, Arcachon, June 4-5, 1931.

Records with 500 kg (1,102 lb.) Useful Load

Altitude.—9 532 m (31,284 ft.). France, Bourdin, on Lioré et Olivier, (2) 690 h.p. Hispano-Suiza, Antibes, January 29, 1934.

Speed, 1 000 km (621.4 miles).—222,277 km/hr (138.1 m.p.h.). Germany, R. Starke, on Heinkel H.E.9, 600 h.p. B.M.W. VI., Warnemünde, June 10, 1929.

2 000 km (1,242.8 miles).—185,931 km/hr (115.5 m.p.h.). France, Paris and Hébert, on Latécoère 28, 650 h.p. Hispano-Suiza, St. Laurent de Salanque, June 21, 1930.

Records with 1 000 kg (2,205 lb.) Useful Load

Altitude.—8 864 m (29,082 ft.). France, Bourdin, on Lioré et Olivier, (2) 690 h.p. Hispano-Suiza, Antibes, December 26, 1933.

Speed, 1 000 km (621.4 miles).—190,004 km/hr (118 m.p.h.). France, Paris and Hébert, on Latécoère 28, 650 h.p. Hispano-Suiza, St. Laurent de Salanque, June 22, 1930.

2 000 km (1,242.8 miles).—185,931 km/hr (115.5 m.p.h.). France, As above.

Records with 2 000 kg (4,410 lb.) Useful Load

Altitude.—7 507 m (24,630 ft.). France, Bourdin, on Lioré et Olivier, (2) 690 h.p. Hispano-Suiza, Antibes, January 3, 1934.

Speed, 1 000 km (621.4 miles).—177,279 km/hr (110.1 m.p.h.). Germany, R. Wagner, on Dornier Super Wal, (4) 480 h.p. Gnome-Rhône "Jupiter," Friedrichshaven, February 5, 1928.

2 000 km (1,242.8 miles).—163,628 km/hr (101.7 m.p.h.). France, Demougeot and Gonord, on Latécoère 83, 650 h.p. Hispano-Suiza, Martincap Magmam, September 2, 1931.

Records with 5 000 kg (11,025 lb.) Useful Load

Altitude.—6 220 m (20,407.8 ft.). U.S.A., Boris Sergievsky and R. B. Quick, on Sikorsky S-42, (4) 670 h.p. Pratt and Whitney "Hornet," Bridgeport, May 17, 1934.

Greatest Load to Ceiling of 2 000 m (6,560 ft.)

7 533 kg (16,610.7 lb.).—U.S.A. Boris Sergievsky and R. B. Quick, on Sikorsky S-42, (4) 670 h.p. Pratt and Whitney "Hornet," Bridgeport, May 17, 1934.

(LIGHT SEAPLANES)

Category 1. Multi-seaters not exceeding 680 kg

Distance in Straight Line.—122,560 km (76.16 miles). France, Lallouette and Albut, on Farman 251 bis., 95 h.p. Renault, Pecq-Caudebec-en-Caux, May 13, 1931.

Altitude.—7 362 m (24,154.7 ft.). Italy, F. Niclot and M. Lanciani, on Fiat A.S.1, 160 h.p. C.N.A.C-7, Littorio, December 28, 1932.

Speed, 100 km (62.14 miles).—189,433 km/hr (117.7 m.p.h.). France, Lallouette and Boulanger, on Farman 231 bis., 95 h.p. Renault, Draveil-Montereau, March 28, 1931.

Category 2. Single-seaters not exceeding 570 kg

Altitude.—8 411 m (27,596.5 ft.). Italy, F. Niclot, on E.T.A.-C.N.A., 160 h.p. C.N.A.C-7, Littorio, November 6, 1933.

Speed, 100 km (62.14 miles).—165,044 km/hr (102.5 m.p.h.). Germany, A. Grundke, on Junkers J50 CV, 85 h.p. Armstrong-Siddeley "Genet," Dessau, June 13, 1930.

Category 3. Multi-seaters not exceeding 350 kg

Altitude.—3 231 m (10,601 ft.). France, J. de Viscaya and Forestier, on Farman F231, 40 h.p. Salmson, Pecq, June 11, 1931.

Speed, 100 km (62.14 miles).—143,540 km/hr (89.19 m.p.h.). France, J. de Viscaya and Chaudet, on Farman 230, 40 h.p. Salmson, Pecq-Bonnières-Le Roule, June 26, 1931.

Category 4. Single-seaters not exceeding 250 kg

Altitude.—3 461 m (11,355.5 ft.). France, Vercruysse, on Mauboussin-Peyret, 34 h.p. A.B.C. "Scorpion," Argenteuil, December 10, 1930.

Speed, 100 km (62.14 miles).—122,783 km/hr (76.3 m.p.h.). France, Vercruysse, on Mauboussin-Peyret, 34 h.p. A.B.C. "Scorpion," Chautou-Epinay, December 22, 1930.

CLASS Cter (AMPHIBIANS)

Speed, Ground Level.—289,290 km/hr (179.75 m.p.h.). U.S.A.,

A. P. de Seversky, on Seversky, 420 h.p. Wright "Whirlwind," Roosevelt Field, October 9, 1933.

WOMEN'S RECORDS CLASS C (AEROPLANES)

Distance in Straight Line.—3 939,245 km (2,447.8 miles). U.S.A., Amelia Earhart, on Lockheed "Vega," 450 h.p. Pratt and Whitney "Wasp," Los Angeles-New York, August 24-25, 1932.

Altitude.—9 791 m (32,134.3 ft.). France, Maryse Hilsz, on Morane-Saulnier, 428 h.p. Gnome-Rhône, Villacoublay, August 19, 1932.

Speed, Ground Level.—405,920 km/hr (252.2 m.p.h.). U.S.A., May Hailip, on Wedell-Williams, 450 h.p. Pratt and Whitney "Wasp," Cleveland, September 5, 1932.

Speed, 100 km (62.14 miles).—281,470 km/hr (175 m.p.h.). U.S.A., Amelia Earhart, on Lockheed "Vega," 420 h.p. Pratt and Whitney "Wasp," Detroit, June 25, 1930.

Light Planes Category 2. Single-seaters not exceeding 450 kg

Distance in Straight Line.—2 976,910 km (1,849.8 miles). France, Marvse Bastié, on Klemm, 40 h.p. Salmson, Le Bourget-Urino (Russia), June 28-29, 1931.

Altitude.—5 900 m (19,359 ft.). France, Hélène Boucher, on Mauboussin-Peyret-Zodiac, 60 h.p. Salmson, Orly, August 2, 1933.

Light Seaplanes Category 2. Single-seaters not exceeding 570 kg

Altitude.—5 554 m (18,222.6 ft.). Italy, C. Negrone, on Breda 15, 80 h.p. Isotta-Fraschini, Gênes, May 5, 1934.

CLASS A (BALLOONS)

Category 1. 600 m³ (21,190 cu. ft.)

Duration.—22 hr. 34 min. France, Georges Cermier, August 10-11, 1924.

Distance.—804,173 km (499.7 miles).

Category 2. 900 m³ (31,783 cu. ft.)

Duration.—23 hr. 28 min. France, Jules Dubois, May 14-15, 1922.

Distance.—804,173 km (499.7 miles).

Category 3. 1 200 m³ (42,377.6 cu. ft.)

Duration.—26 hr. 46 min. U.S.A., E. J. Hill and A. C. Schlosser, Detroit-Montvale, July 4-5, 1927.

Distance.—1 238 km (769.3 miles). France, G. Ravaine, de Bâle to Tokary, Poland, September 25-26, 1932.

Category 4. 1 600 m³ (56,503.5 cu. ft.)

Duration.—26 hr. 46 min. U.S.A., E. J. Hill and A. C. Schlosser, July 4-5, 1927.

Distance.—1 238 km. (769.3 miles). France, G. Ravaine and Bâle, September 25-26, 1932.

Category 5. 1 601-2 200 m³ (56,539-77,692 cu. ft.)

Duration.—51 hr. U.S.A., T. G. W. Settle and C. H. Kendall, Chicago-Brandforth, September 2-4, 1933.

Distance.—1 550 km. (963.2 miles). U.S.A., T. G. W. Settle and W. Bushnell, Bâle-Daugieliskii, Poland, September 25-27, 1932.

Category 6. 2 201-3 000 m³ (77,727.6-105,944 cu. ft.)

Duration.—51 hr. U.S.A., T. G. W. Settle and C. H. Kendall, Chicago-Brandforth, September 2-4, 1933.

Distance.—1 550 km (963.2 miles). U.S.A., T. G. W. Settle and W. Bushnell, September 25-27, 1932.

Altitude.—8 690 m (28,512 ft.). U.S.A., H. C. Gray, March 9, 1927.

Category 7. 3 001-4 000 m³ (105,979.5-141,259 cu. ft.)

Duration.—51 hr. U.S.A., T. G. W. Settle and C. H. Kendall, September 2-4, 1933.

Distance.—1 550 km (963.2 miles). U.S.A., September 25-27, 1932.

Altitude.—8 690 m (28,512 ft.). U.S.A., H. C. Gray, March 9, 1927.

Category 8. Over 4 001 m³ (141,294 cu. ft.)

Duration.—87 hr. Germany, H. Kaulen, December 13-17, 1913.

Distance.—3 052,700 km (189.7 miles). Germany, Berliner, February 8-10, 1914.

Altitude.—18 665 m (60,230.8 ft.). U.S.A., T. G. W. Settle and C. L. Fordney, Akron, Ohio, November 20, 1933.

CLASS B (AIRSHIPS)

Distance in Straight Line.—6 384,500 km (3,967.3 miles). Germany, Dr. Eckener, in L.Z.127, Graf Zeppelin, (5) 450-550 h.p. Maybach, Lakehurst, U.S.A.-Friedrichshaven, Germany, October 29-November 1, 1928.

CLASS D (GLIDERS)

Distance in Straight Line.—240 km (149.1 miles). Germany, H. Fischer, on "Windspiel," Griesheim (Darmstadt)-Thonneheim (Montmédy), June 16, 1934.

Duration (returning to point of start).—36 hr. 35 min. Germany, Kurt Schmidt, on D-Loerzer, type Grunau Baby, Korschenruk, August 3-4, 1933.

Altitude.—2 589 m (8,494.5 ft.). Austria, R. Kronfeld, on Wien, Lienas, July 30, 1929.

CLASS G (HELICOPTERS)

Duration (returning to point of start).—8 min. 45 sec. Italy, M. Nelli, on d'Ascanio, Fiat A-50, Rome, October 8, 1930.

Distance in Straight Line.—1 078,600 m (3,538.8 ft.). Italy, M. Nelli, on d'Ascanio, Fiat A-50, Rome, October 10, 1930.

Altitude.—18 m (59 ft.). Italy, M. Nelli, on d'Ascanio, Fiat A-50, Rome, October 13, 1930.

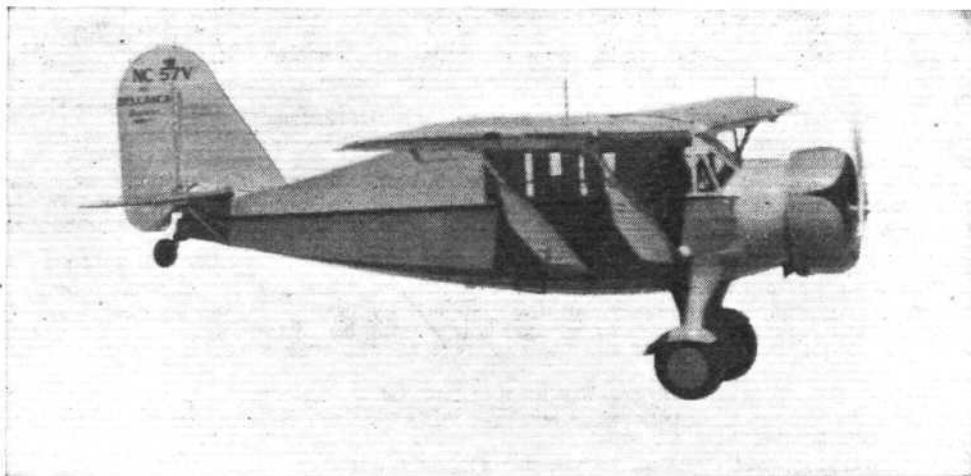
FOREIGN AIRCRAFT

1934 BELLANCA "SENIOR SKYROCKET"

Cantilever "Load Compensator" Undercarriage and Other Refinements Give Considerably Increased Performance

OF unmistakable Bellanca design, the "Senior Skyrocket" for 1934 is a six-seater monoplane. The wings are of two-spar wooden construction. Trailing edge flaps are fitted, and the bracing struts form supplementary lifting surfaces at high angles of attack. Plywood covering is used for the leading edge of the wing, preventing the fabric from becoming depressed between the ribs, and maintaining the full lift characteristics. In each wing is a 100-gallon welded aluminium fuel tank resting on felt pads. The "slot balanced" ailerons, of high aspect ratio, are effective after the stalling point has been reached. The cabin is 124 in. long, 45.5 in. high and 57.5 in. wide. A baggage compartment behind the rear seats, accessible from inside and outside, has a capacity of 15 cu. ft. Individually operated ventilation, adjustable rear windows, and cabin heater are standard equipment. By means of a duct beneath the cabin floor fresh air is taken from a point on the front wing strut and supplied to the cabin. The amount of air to each seat is controlled by butterfly valves in the floor, and the two main air ducts terminate in large outlets in the rear cabin wall, so that if the individual ducts are in operation or not a continuous supply of fresh air enters the cabin at all times during flight. The heating arrangements are carried out through the same system, the pilot controlling the mixture of the heated and the fresh cold air by means of a master valve. Heat is supplied by fresh air passing through a metal cuff enclosure or "stove" on two portions of the engine exhaust manifold.

A new type of cantilever undercarriage is used. In this the oleo struts are mounted in the lower portion of the fuselage

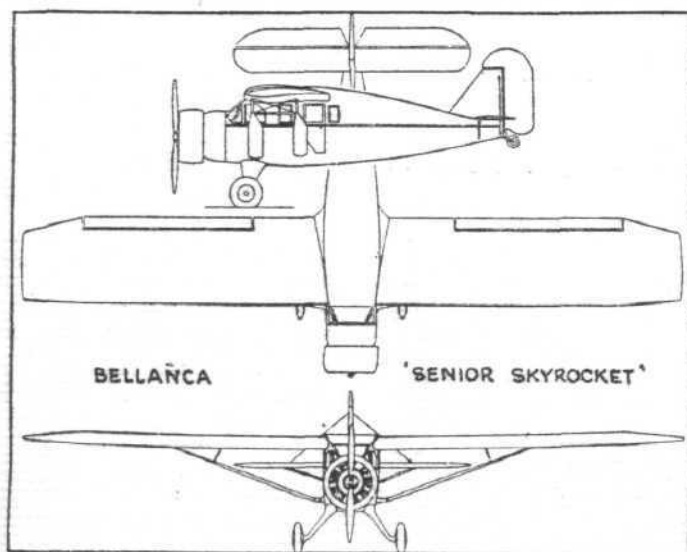


A SIX-SEATER: The Bellanca "Senior Skyrocket" cabin monoplane.

in "crosswise" or opposed fashion, transmitting loads from each "arm" of the undercarriage to the opposite side of the fuselage.

A Pratt and Whitney S.1 D.1 "Wasp" rated at 525 h.p. at 7,000 ft. is the standard power plant. This engine is provided with an Eclipse direct drive electric starter and a hand crank. The cowling is of the full N.A.C.A. type firmly attached by means of a compression system wherein felt pads in individual sockets are made to fit tightly over the rocker box heads by means of a master screw tightening device. The cowling behind the engine is in four segments. An oil tank with a capacity of 14 gallons is carried beneath the engine cowling.

The "Senior Skyrocket" is available in "Standard" and "De Luxe" form, both being powered by the Pratt and Whitney "Wasp" S.1 D.1. The two models differ mainly in matters of equipment, the "De Luxe" type being custom-equipped and having a specially arranged cabin interior, additional instruments and more latitude in the choice of colours and upholstery materials. Each model may be converted into a seaplane.



1934 BELLANCA "SENIOR SKYROCKET" ("DE LUXE" MODEL)

Pratt & Whitney "Wasp" S.1 D.1 (525 h.p. at 7,000 ft.)

DIMENSIONS			
Span	...	...	50 ft. 6 in. (15.4 m)
Length	...	...	27 ft. 11 in. (8.5 m)
Height	...	...	8 ft. 6 in. (2.6 m)
Wing area	...	...	311 sq. ft. (28.9 m ²)
WEIGHTS			
Weight empty	...	...	3,300 lb. (1,496.5 kg)
Gross weight	...	...	5,600 lb. (2,540 kg)
Wing loading	...	...	18 lb./sq. ft. (87.9 kg/m ²)
Power loading	...	...	10.6 lb./h.p. (4.8 kg/hp)
PERFORMANCE			
Top speed at 7,000 ft. (2,131 m)	...	...	185 m.p.h. (298 km/hr)
Cruising speed at 66 per cent. power	...	...	159 m.p.h. (254 km/hr)
Service ceiling	...	...	25,000 ft. (7,620 m)
Range	...	...	910 miles (1,464 km) to 1,280 miles (2,060 km)

MUREAUX 113,R2

Latest French Reconnaissance Machine to Go Into Service

A LARGE batch of Mureaux 113,R2 reconnaissance machines is at present being built for the re-equipment of certain units of the French "Armée de l'Air." Although classed as a reconnaissance aircraft, and bearing the suffix "R2" to its title (which denotes that the machine is a two-seater and is used for reconnaissance) the type is suitable for artillery observation, day and night fighting and light bombing duties.

The machine is a high wing semi-cantilever monoplane, the wing covering being of sheet duralumin riveted to the spars and stringers. A detachable leading edge is fitted to the wing

to facilitate inspection. Unbalanced ailerons of high aspect ratio are used.

A number of transverse duralumin bulkheads joined by four longerons of "U" section form the main fuselage structure. Strips of duralumin sheeting are placed longitudinally along the sides of the fuselage and laterally across the domed top and bottom. The tail unit is a normal monoplane structure employing an adjustable tail plane, and the undercarriage is a wide split axle type with Oleo-pneumatic shock absorbers and differentially controlled wheel brakes.



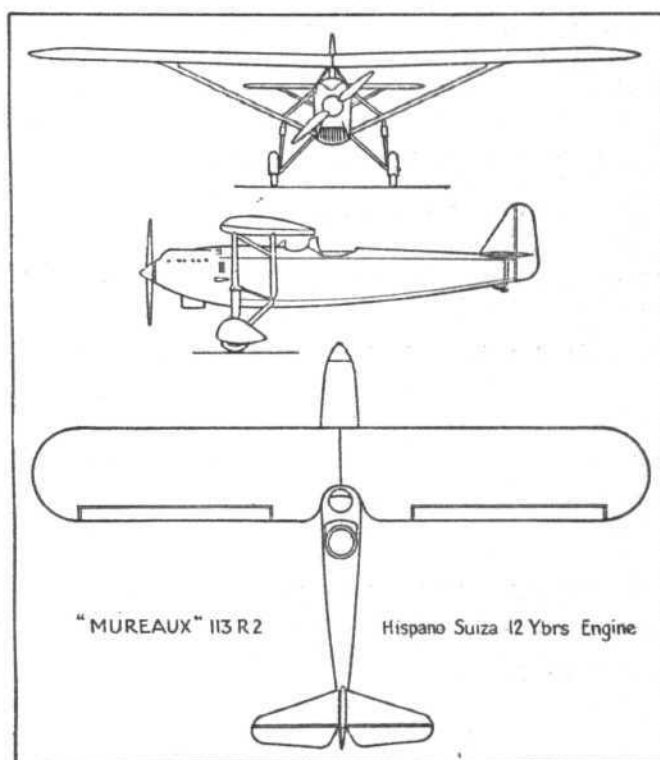
FOR RECONNAISSANCE: The Mureaux 113.R2 (Hispano-Suiza 12 Ybrs engine) high-wing monoplane. It can also be used for light bombing.

A cockpit containing an adjustable seat and rudder bar is provided for the pilot under the cut-out in the trailing edge of the wing. The observer is placed immediately behind, and is well protected from the air stream. Dual control is optional. The normal armament consists of two synchronised guns for the pilot and one or two machine guns on a mounting over the rear cockpit.

The power plant adopted by "l'Armée de l'Air" for use in the machine is the Hispano-Suiza 12Ybrs geared and supercharged-liquid cooled type. This is fitted to a quickly detachable mounting, with a "tunnel" type radiator mounted below.

In the accompanying table the performance figures refer to the machine equipped for reconnaissance work. At 16,400ft. (5,000 m) the range is 570 miles (920 km) at a cruising speed of 150 m.p.h. (240 km/hr).

MUREAUX 113.R2			
Hispano-Suiza 12 Ybrs—650/860 h.p.			
DIMENSIONS			
Span ...	...	...	50 ft. 6 in. (15.4 m)
Length ...	...	...	32 ft. 9½ in. (10 m)
Height ...	...	...	11 ft. 10 in. (3.63 m)
Wing area ...	...	...	375.5 sq. ft. (34.9 m²)
WEIGHTS			
Weight empty...	...	...	3,307 lb. (1 500 kg)
Gross weight ...	...	...	5,487 lb. (2 480 kg)
PERFORMANCE			
Speed at 3,280 ft. (1 000 m) ...	...	...	185 m.p.h. (297 km/hr)
Speed at 16,400 ft. (5 000 m) ...	...	...	197 m.p.h. (318 km/hr)
Speed at 26,246 ft. (8 000 m) ...	...	...	190 m.p.h. (306 km/hr)
Climb to 3,280 ft. (1 000 m) ...	...	...	1 min. 45 sec.
Climb to 16,400 ft. (5 000 m) ...	...	...	8 min. 10 sec.
Climb to 26,246 ft. (8 000 m) ...	...	...	16 min. 20 sec.
Ceiling ...	...	...	34,120 ft. (10 400 m)



A CAPRONI FIGHTER. The Caproni 114 single-seater fighter fitted with a Bristol "Mercury" IV engine. It may be used for inverted flying and aerobatic training. The top speed is about 217 m.p.h. and the climb to 9,840 feet occupies 4 minutes.

THE ROYAL AIR FORCE

Service Notes and News



Air Ministry Announcements

THE N.W. FRONTIER OF INDIA

In a fight between 200 tribesmen led by the Faqir of Alingar and the Malakand levies to the north of Peshawar an aeroplane of the R.A.F. was fired on by the tribesmen and returned the fire, inflicting some casualties. The Faqir's party was driven out of the Malakand protected area.

FORCED LANDING ON N.W. FRONTIER

A "Wapiti" of No. 28 (A.C.) Squadron, Ambala, made a forced landing near Khanki Bazar, in the territory of the Orakzai tribe, on August 9. The pilot was Flt. Lt. F. W. Sinclair, D.F.C., and the gunner was AC. A. Watson, of Bethnal Green Road, London. Both have been brought in to hospital. During the war Orakzai sepoys fought gallantly in France in various Indian regiments.

CRANWELL CADETS

The following have passed into the R.A.F. College, Cranwell, at the competitions held last June, and have been passed as physically fit:—

Kerr, D. A.; Gibbs, R. P. M.; Inness, W. I. C.; Blount, C. R.; Tait, J. B.; Phillips, A. M. K.; Astley, P. M.; Humphris, J. H.; Chamberlain, P. B.; Fordham, J. W.; Barron, O. J. M.; Ingle, W. H.; Joliffe, P. S.; Shand, W. P.; Bangay, R. J. M.; Greville Bell, D.; Bulloch, A. A. T.; Culverwell, E.; Smith, C. D. S.; Powell, R. P. R.; Godfrey, O.

King's Cadet who has qualified for Cranwell.—Winter, R. H.
Honorary King's Cadet who has qualified for Cranwell.—Stevenson, M. G.

ANTI-AIRCRAFT BATTERY FOR MALTA

The King has approved the formation of the 13th Anti-Aircraft Battery, Royal Artillery, for service in Malta. The unit will be brigaded in the 4th Heavy Brigade, Royal Artillery.

FIRE AT KIDBROOKE

Four fire engines were called to the Royal Air Force No. 1 Stores Depot at Kidbrooke early on Wednesday, August 8, when a watchman found that a shed used for experimental purposes was on fire. The fire was prevented from spreading, and the main part of the stores was not affected.

THE ROYAL AIR FORCE BENEVOLENT FUND

The usual meeting of the Grants Committee of the Fund was held at Iddesleigh House, on August 8. Mr. W. S. Field was in the chair, and the other members of the committee present were: Air Com. B. C. H. Drew, C.M.G., C.B.E.; Wing Com. H. P. Lale, D.S.O., A.F.C. The committee considered in all a number of cases, and made grants to the amount of £333 10s. The next meeting was fixed for Thursday, August 23, 1934, at the offices of the Fund, at 2.30 p.m.

NEW TYPE OF AIR OBSERVER

The Air Ministry announces that a new type of air observer is being introduced.

These observers will be drawn very largely from the trades of armourer, photographer and wireless operator, which will in future be recruited from a new class of personnel known as "boy entrants." A certain number of airmen pilots will also be drawn from these trades.

Boy entrants will be selected for interview from among candidates who have sat for the competitive examination for aircraft apprentices, and who, owing to the limited number of vacancies, cannot be accepted as apprentices. The age limits for the aircraft apprentice examination are 15-17 years.

The following are extracts from the order issued:—

It has been for some time clear that the present system of providing for observer duties in the Royal Air Force by the employment of airmen as air gunners, mainly on a part-time basis, has been becoming increasingly inadequate to the fighting requirements of the service as the work of squadrons increased in complexity and as the organisation of the crews of aircraft developed. The Air Council have accordingly decided, as the result of very full and careful consideration, to introduce a new type of observer, to be known as air observer, as outlined below. These airmen will replace the existing full-time air gunner and (save in flying boat squadrons, two-seater fighter squadrons and, to an extent, in army co-operation squadrons) the part-time air gunner will also disappear. Observers in the Fleet Air Arm will continue to be provided from naval sources. The aim is to provide that:—(i) The observer should be an airman of good type and of adequate educational standard. (ii) Employment as observer should extend over as long a period as practicable. (iii) The observer should be of adequate rank and experience. (iv) He should be adequately trained.

Observers will be drawn from the following trades in the approximate proportions shown:—

Fitter (armourer), 8 per cent.; armourer, 16 per cent.; wireless operator mechanic, 16 per cent.; wireless operator, 40 per cent.; photographer, 7 per cent.; fitter (including rigger), 9 per cent.; instrument maker, 4 per cent.

Eighty-seven per cent. of air observers will therefore be drawn from the armament, signal and photographer trades. These trades were selected because their duties are most closely connected with the work of squadrons in the air; their personnel will therefore gain most in the efficiency of their work on the ground by being used to perform analogous duties in the air and the organisation of their time on a half-observer, half-trade basis presents the least difficulties. It will be observed that 37 per cent. of air observers will be drawn from apprentice trades and the remainder from the three trades (armourer, wireless operator and photographer) which will in future be recruited from the new class of boy entrants.

To secure the remaining three requirements airmen will be selected for training as observer when they have had approximately seven years' man's service and will continue to be available for employment as observer during the remainder of their first period of engagement and, if re-engaged, until they complete eighteen years' man's service, unless previously promoted above the rank of sergeant. During the years of their availability for employment as air observers their postings will normally be to squadrons in which they can be so employed. While selection for observer duties carries with it no guarantee of selection for re-engagement, the policy will be to select for these duties airmen who are considered likely to be suitable for re-engagement and, as far as the non-apprentice tradesmen are concerned, the great majority of those re-engaged will have qualified as air observers. On posting to a unit for duty as air observer, on satisfactory completion of the course of instruction at the Air Armament School, they will be promoted to the rank of corporal if they do not already hold that rank.

The duties of observers will vary widely between different types of squadron and will develop with changes in tactical ideas and material (e.g., the introduction of the automatic pilot). Their main training must therefore take place in squadrons. Airmen selected for air observer will, however, be given a two months' initial course in gunnery and bombing at the Air Armament School, on the successful completion of which they will be regarded as eligible for posting as air observers.

The basis of allocation of observers will be as follows:—S.E.B., T.E.B. and T.B. squadrons.—1 for each aircraft on initial equipment; and Army co-operation squadrons.—1 for each flight. They will be employed half-time as observers and half-time on the duties of their trade, and the establishments of squadrons will be increased to permit of this.

Air observers will receive the pay of their rank and group and, in addition, while they are employed as observers, they will be entitled, under the usual conditions, to air gunner pay and crew pay. They will remain on the promotion roster of their trade and will cease to be available for employment on observer duties on being promoted to the rank of flight sergeant or on completing eighteen years' man's service, whichever shall occur first.

Full-time air gunners not selected for air observer duties will continue to serve as full-time air gunners until reverted to their basic trades.

CAREERS OF AIRMEN

The review of the requirements of the Service in airmen has now reached the stage when decisions can be announced as regards the great majority of air force trades and these decisions are outlined below.

In examining this question, a review has been made of the sources from which airmen of the various categories should be drawn and it has been decided that groups I, II, III and V shall normally be recruited from the following sources:—

(i) Aircraft apprentice entrants. (Group I trades of fitter, fitter (armourer), wireless operator mechanic and instrument maker).

(ii) Boy entrants. (Group II trades of armourer, wireless operator and photographer).

(iii) Skilled men entered directly from civil life. (Group I and group II trades not provided for under (i) (ii) or (iv)).

(iv) Airmen selected from aircrafthands. (Group III and group V trades and the group II trade of rigger (airship)).

While the opportunities available in any one trade must depend on the requirements of the service from time to time, policy will be directed to securing for each class of entrant an appropriate career offering prospects of promotion and re-engagement which are broadly uniform, irrespective of the trade for which the airman enters or is selected. Though the normal method of entry into the various trades will be as indicated above, airmen who can qualify for remustering without a course of technical instruction will be permitted to remuster under the same conditions as at present. In certain trades (e.g., moulder, draughtsman) where, owing to the small numbers involved, the provision of an adequate career on a service basis is impracticable, and where continuity of employment is desirable, a policy of civilianisation has been adopted.

ROYAL AIR FORCE GAZETTE

London Gazette, August 7, 1934

General Duties Branch

Pilot Officer on probation C. G. Lott is confirmed in rank (July 10).

The undermentioned Pilot Officers are promoted to the rank of Flying Officer:—J. C. Pope, E. B. C. Davies, S. P. A. Patmore, W. R. Brotherhood, P. S. Salter, A. R. G. Bax, R. L. Bradford (June 17); H. S. Laws (July 23).

Lt. J. E. Burstall, R.N., is reattached to the R.A.F. as a Flight Lieutenant with effect from July 29 and with seniority of July 1, 1933.

Group Capt. J. H. A. Landon, D.S.O., O.B.E., is placed on the half-pay list, scale A (Aug. 5).

The undermentioned officers are placed on the retired list:—

Sqd. Ldr. F. P. Adams (Aug. 7); Flt. Lt. R. W. Daves (Aug. 6); Flt. Lt. N. Keeble, D.S.C., D.F.C. (Aug. 4); Group Captain J. T. Cull, D.S.O., is placed on the retired list at his own request (Aug. 6); Group Captain H. L. Reilly, D.S.O., is placed on the retired list at his own request (Aug. 5); Flt. Lt. F. Boston is placed on the retired list on account of ill-health (Aug. 8); Lt. A. J. Tillard, R.N., F/O., R.A.F., relinquishes his temporary commission on return to Naval duty (July 25); F/O. L. O. Welch (Lt., North Staffordshire Regt.) relinquishes his temporary commission on return to Army duty (July 15); F/O. L. S. Cundell (Lt., Lancashire Fusiliers) relinquishes his temporary commission on return to Army duty (July 15).

Stores Branch

F/O. J. E. Atkins is transferred to a commission as commissioned engineer officer on probation with effect from July 20, and with seniority of April 13, 1931.

Medical Branch

Flt. Lt. B. W. Cross, M.R.C.S., L.R.C.P., is promoted to the rank of Sqd. Ldr. (Aug. 4); Group Captain E. C. Clements, C.B.E., M.R.C.S., L.R.C.P., is placed on the retired list (Aug. 5).

Commissioned Engineer Officers

The undermentioned Warrant Officers are granted permanent com-

missions as Flying Officers on probation, with effect from and with seniority of July 20:—

C. W. Baker, M.B.E., V. J. Casey, F. W. H. Gee, H. E. Newing, P. McDiarmid, A.F.M., H. Hipwood.

Commissioned Signals Officers

The undermentioned Warrant Officers are granted permanent commissions as Flying Officers on probation, with effect from and with seniority of July 20:—

J. R. Welsh, A.F.M., R. K. Nicholas.

Commissioned Armament Officer

Warrant Officer R. B. Cleaver is granted a permanent commission as Flying Officer on probation with effect from and with seniority of July 20.

ROYAL AIR FORCE RESERVE

*Reserve of Air Force Officers**General Duties Branch*

The undermentioned Flying Officers relinquish their commissions on completion of service:—D. Hay (July 3); H. A. Denny (July 20).

F/O. G. B. Rahr (2nd Lt., Supplementary Reserve of Officers) relinquishes his commission on completion of service (July 29).

The notification in the *Gazette* of May 8 concerning F/O. G. P. Jewett is cancelled.

Stores Branch

Flt. Lt. E. A. Sullock, A.F.C., is transferred from class B to class C (April 16).

Medical Branch

The undermentioned are granted commissions as Flying Officers in class DD:—T. G. Hovenden, M.R.C.S., L.R.C.P. (July 17); R. D. Bruce, M.B., Ch.B. (July 18).

SPECIAL RESERVE

General Duties Branch

E. W. Martin is granted a commission as Pilot Officer on probation (July 7).

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the Royal Air Force are notified:—

General Duties Branch

Group Captain.—N. C. Spratt, O.B.E., to Headquarters, Inland Area, Stanmore. On appointment as Senior Equipment Staff Officer vice Grp. Capt. J. H. A. Landon, D.S.O., O.B.E., 5.8.34.

Wing Commanders.—G. H. Bowman, D.S.O., M.C., D.F.C., to No. 23 Group Headquarters, Grantham. For Air Staff duties vice Wing Com. R. S. Maxwell, M.C., D.F.C., A.F.C., 6.8.34. M. L. Taylor, to Station Headquarters, Farnborough. To command vice Wing Com. G. H. Bowman, D.S.O., M.C., D.F.C., 6.8.34. E. L. Tomkinson, D.S.O., A.F.C., to Reception Depot, West Drayton. To command, temporarily, vice Grp. Capt. H. L. Reilly, D.S.O., 5.8.34. E. B. Beauman, to Headquarters, Coastal Area, Lee-on-the-Solent. For Air Staff duties, vice Wing Com. C. E. Maude, 28.7.34.

Squadron Leaders.—C. Porri, to Headquarters, Coastal Area, Lee-on-the-Solent. For Photographic duties, vice Sqd. Ldr. F. R. Wynne, M.B.E., 1.8.34. F. O. Soden, D.F.C., to No. 65 (F) Squadron, Hornchurch. To command, 1.8.34. A. Durston, A.F.C., to Headquarters, Coastal Area, Lee-on-the-Solent. For Air Staff duties vice Sqd. Ldr. T. W. Elsdon, 6.8.34. E. P. Mackay, to No. 111 (F) Squadron, Northolt. To command vice Wing Com. M. B. Frew, D.S.O., M.C., A.F.C., 1.8.34.

Flight Lieutenants.—F. G. Cator, to No. 1 Air Defence Headquarters, London, W.C.1., 21.7.34. R. F. Shenton, to R.A.F. Base, Gosport, 24.7.34. E. B. Steedman, to Marine Aircraft Experimental Establishment, Felixstowe, 9.7.34. R. C. Jordan, to Home Aircraft Depot, Henlow, 18.7.34. J. M. Glaisher, D.F.C., to No. 10 (B) Squadron, Boscombe Down, 3.8.34. C. H. Harrison, to No. 65 (F) Squadron, Hornchurch, 1.8.34. A. H. Montgomery, M.B.E., to No. 23 (F) Squadron, Biggin Hill, 3.8.34. J. C. Barraclough, to Station Headquarters, Manston, 6.8.34. A. C. Mitchell, to Station Headquarters, Pembroke Dock, 6.8.34.

Flying Officers.—G. R. Canavan, to R.A.F. Base, Calshot, 23.7.34. F. A. Pearce, to School of Naval Co-operation, Lee-on-the-Solent, 22.7.34. J. B. Sims, to No. 6 (B) Squadron, Ismailia, Egypt, 20.7.34. A. W. Vincent, to Armament Training Camp, Leuchars, 30.7.34. R. C. Reynell, to No. 43 (F) Squadron, Tangmere, 1.8.34.

Stores Branch

Flight Lieutenants.—W. St. J. Littlewood, to Administrative Wing, Cranwell, 30.7.34. G. Scarrott, to Station Headquarters, Worthy Down, 1.8.34.

Flying Officers.—R. D. Williams, to School of Store Accounting and Storekeeping, Cranwell, 19.7.34. P. G. Bullen, to Station Headquarters, Upper Heyford, 28.7.34. A. H. M. Hely, to Station Headquarters, Hendon, 28.7.34. W. M. King, to Headquarters, R.A.F., Cranwell, 28.7.34. G. I. Rees, to Station Headquarters, Biggin Hill, 28.7.34. A. Selby, to Station Headquarters, Abingdon, 28.7.34.

Accountant Branch

Flying Officer.—T. C. Reep, to No. 504 (County of Nottingham) (B) Squadron, Hucknall, 1.8.34.

Pilot Officers.—A. Gollan, to Station Headquarters, North Weald, 29.7.34. W. N. Hibbert, to Station Headquarters, Mount Batten, 29.7.34. R. C. S. Allin, to Air Armament School, Eastchurch, 5.8.34.

Medical Branch

Group Captain.—W. A. S. Duck, O.B.E., to D.M.S., Dept. of Air Member for Personnel, Air Ministry. For Medical Staff duties, vice Grp. Capt. F. C. Cowtan, 30.7.34.

Squadron Leaders.—H. M. Daniel, to Station Headquarters, Boscombe Down. For duty as Medical Officer, 29.7.34. P. C. Livingston, to Central Medical Establishment, London, W.C.2. For duty as Medical Officer, 30.7.34.

Flight Lieutenant.—S. B. S. Smith, to Station Headquarters, Heliopolis, 2.7.34.

CORRESPONDENCE

The Editor does not hold himself responsible for opinions expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters intended for insertion in these columns.

IRISH-BUILT MONOPLANE TESTED

[2955] May I be permitted to deal with the remarks of Lady Heath, as well as those of your Irish correspondent, appearing in the current issue relative to the above? May I again remind them that I originally stated that the aircraft concerned is a rebuilt civilian coupé? It is now admitted by them that I am correct. It doesn't matter two "hoots" whether the fuselage was extensively damaged or not in the crash. For their information and guidance I would draw to their attention the "Book of Rules," officially known as A N D. This publication contains the requirements necessary before certificates are granted, whether the certificate is for a "type," "series," or reconditioned airframe.

Further, I also am conversant with the controlling body under the Dept. of Industry and Commerce, and I must, with all due respect, submit that this office is nothing more or less than a "rubber stamp" for all work done within its jurisdiction. I would also draw Lady Heath's attention to the fact that this office has never yet issued anything in the nature of a notice to aircraft owners and ground engineers, so that essential modifications as required are made known to all concerned, and that unworthy aircraft will not be flown, as has been done to the writer's knowledge. Attention has also been drawn to the fact that a detail component has been issued inadvertently, and which has been considered unserviceable by the authorities in Ireland. Whilst not disproving this statement of hers, I am not prepared without further evidence to believe the A.I.D. stamp was on the part in question, and issued with a release note. Would your correspondent inform us as to the qualifications of the inspectors who usually do inspections for C. of A.'s for Aircraft in Ireland? I am aware that there is a chief engineer employed by the Dept. of Defence, for duties in connection with all aircraft, civil and military, but this gentleman does not usually perform such duties. This has been done by others up to the present, and so far as I can recall two specific cases of this duty have left a sour taste in my mouth, and could not possibly happen with the Air Ministry methods existing across Channel. Finally, to my knowledge, no check inspections, as regards licences, field-airworthiness, etc., has ever been carried out. The writer has given close observation to the above points in connection

with aviation in that State as compared with other countries, and if your correspondents will only admit it, there is lots of room for improvement, so that outsiders will know who is the proper authority for the supervision and administration of civil flying in this country. As things are at present I would suggest that the present buildings be burned down and a proper system started in its stead, with efficient organisation and personnel. Then, and only then, can we open a discussion as to which State's certificates carries the Air-at-Lloyd's hall-mark of efficiency with it.

Belfast.

BRITISH HOSPITALITY

[2956] About three years ago I arrived here from India with a view to qualifying as a ground engineer. Previous to this I held a responsible post with the Ford Motor Company of India, Ltd., after having been trained in their factories in Canada and in the U.S.A. I also had five years' service in the great war.

During my stay in England I had the privilege of having my training with Messrs. de Havilland Aircraft Co., A. V. Roe Co., Ltd., Bristol Aeroplane Co., Armstrong Siddeley, and the Imperial Airways, Ltd., and in several cases I was assisted by the office of the High Commissioner for India in London, and now I have obtained the ground engineer's licences in categories A, B, C and D.

Inasmuch as I am expecting to return to India shortly, I feel that I would like to convey my appreciation to those, including the personnel of the Air Ministry, with whom I came in contact during my period of training, and from whom I received valuable assistance.

It would be impossible for me to remember everybody and to write them separate letters acknowledging their good wishes and kind assistance, and therefore I would like to approach all of them through the columns of your weekly journal, which reaches the majority of the people concerned with aircraft and aero-engines.

P. K. GHOSH.

London.

[Mr. Ghosh is an Indian whose work is well known in his native country, and now that he has turned his attention to aviation we feel sure he will do as well in his new sphere.—Ed.]



THE WEIR AUTOGIRO: The experimental model has just resumed its flying tests after certain changes in the engine. It seems likely that the production model, which will be marketed by G. and J. Weir, Ltd., of Glasgow, will differ considerably from the experimental machine. The engine has been developed by Mr. Cyril Pullin and is a flat twin. Note the two-bladed rotor. (Flight Photo.)

THE COPENHAGEN AERO SHOW

Great Britain Well Represented

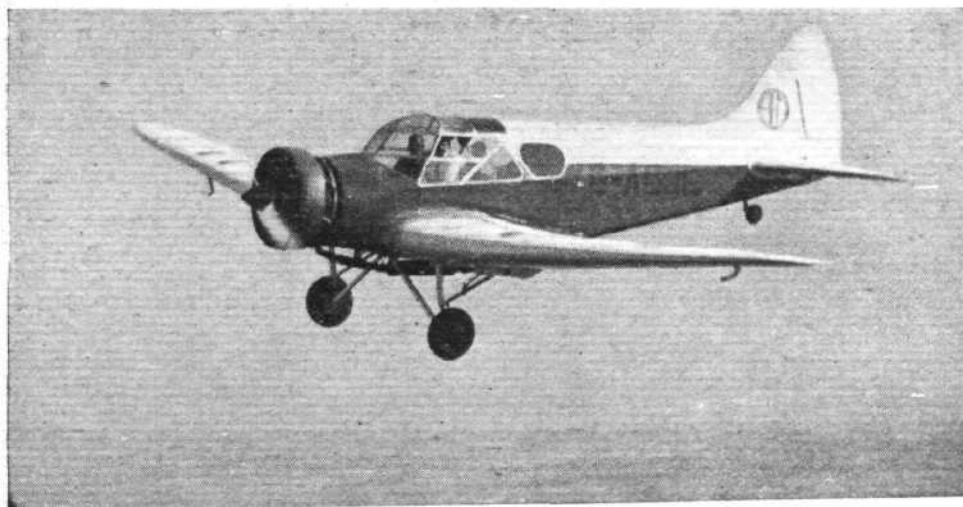
FROM August 17 to September 2 an International Aero Exhibition, the second to be organised by Denmark, will be held in the Forum Hall in Copenhagen. The organisation is in the hands of Det Danske Aeronautiske Selskab (The Danish Aeronautical Society), under the patronage of H.R.H. the Crown Prince of Denmark. The first International Aero Show was held in Copenhagen in 1927, and a number of European countries were represented. This year Great Britain may be said to dominate the foreign exhibitors, the Society of British Aircraft Constructors having taken stand space which almost fills the whole of one end of the Forum Exhibition Hall.

When the Society of British Aircraft Constructors decided to be well represented at Copenhagen, a difficulty at once arose: the question of space. In spite of its Danish title of "Kaempehallen" (the giant hall), the Forum is by no means a large building, judged by British standards, and as the Danish Army and Navy Air Services had reserved the central stands in the hall, there was not much space left in which to exhibit British aircraft. Even so, however, this country has managed to stage an effective show, and a visitor to Copenhagen during the next two weeks can get a very good idea of the present state of British aeronautical development. In many cases it has only been found possible to exhibit scale models of machines, but to make up for this several firms are having machines for demonstration purposes at Kastrup, the airport of Copenhagen, on the island of Amager, just south of the city.

Apart from Great Britain, of foreign countries only France and Soviet Russia are represented at the Exhibition.

OF the British exhibits by far the most imposing is that of the Siddeley group of companies, the Armstrong-Whitworth firm being represented by an A.W. "Scimitar" high-performance single-seater fighter, which is available either with the 635 h.p.

BRITISH AIRCRAFT AT THE SHOW



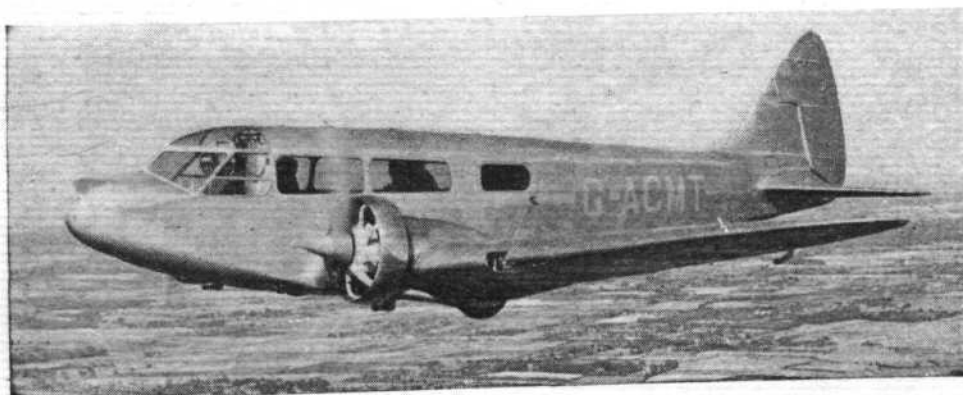
Siddeley "Panther" engine or with the 720 h.p. Siddeley "Tiger." A. V. Roe and Co., Ltd., will exhibit a type 626 with Siddeley "Cheetah" engine, and an Autogiro with 7-cyl. "Genet Major." Both the latter machines, but particularly the 626, are exhibited in a very attractive black enamel and chromium plating finish, which serves admirably to show up the form of construction. Doped surfaces are finished in white. On this stand also there are the Siddeley engine exhibits. At Kastrup an Autogiro will be available for demonstration purposes.

Airspeed (1934), Ltd., will be represented in the exhibition by two scale models and by photographs. The models, which are to a scale of half an inch to the foot, will be of the "Courier" and "Envoy." At Kastrup Mr. M. L. Bramson, who incidentally was born in Denmark, will be giving demonstration flights with a "Courier" from August 17 to August 24.

An historical touch is introduced among the Blackburn exhibits by a scale model of the first Blackburn aeroplane, designed, built and flown by Mr. Robert Blackburn in 1909. Other models will show the B.2 Trainer, the "T.S.R." machine, and the new ten-seater monoplane with Blackburn-Duncanson single-spar wing, which is now being built at Brough. On the Blackburn stand will also be exhibited Hermes engines.

Possibly owing to the fact that the Bristol Aeroplane Company is already

WITH WHEELS DOWN: An Airspeed "Courier" (Siddeley "Cheetah"), similar to that which will be demonstrated at Copenhagen. (Flight Photo.)



WITH WHEELS UP: The Airspeed "Envoy" (2 Wolseley A.R.9 engines) has the same type of retractable undercarriage as the "Courier." (Flight Photo.)

represented in Denmark by the "Bulldogs," with which the Danish Army Air Force is equipped, this firm is not exhibiting any aircraft, but a sectioned "Pegasus" engine, actually in motion, will give visitors a good idea of how this modern British aero engine functions.

A "Moth Major" with "Gipsy Major" engine will represent the De Havilland Aircraft Co., Ltd., in the Forum, and photographs of other De Havilland types will be displayed. Mr. C. Thielst, the Danish D.H. agent, will be in attendance throughout the exhibition to welcome visitors and friends of the company.

Lack of space has prevented the Fairey Aviation Co., Ltd., from exhibiting full-size machines, but scale models of the "Fox" and "Firefly" will, supplemented by photographs and literature, show the clean lines of these two well-known types. One of the actual metal airscrews used in the Schneider Trophy Contest, that of the winner, in fact, will be sure to attract great attention, and will naturally lead visitors to inquire about more orthodox metal airscrews, of which an example will be on view.

The Hawker and Gloster companies, which now belong to the same organisation, will show, among other items, samples of their systems of metal construction, the Hawker samples being in stainless steel, with which this firm has had great success.

A large scale model of the Percival "Gull" ("Gipsy Six") forms the Percival Aircraft Co.'s exhibit, as well as many photographs describing this machine, while a "Gull" ("Gipsy Six") will be at the Kastrup aerodrome throughout the exhibition for demonstrating purposes. The "Gull" is very well known to our readers as a fast three-seater low wing monoplane. Certain modifications have been incorporated in this year's model, chief of which are doors which open forwards, allowing easier access to the cabin and a re-designed undercarriage creating still less drag than the previously well cowled type.

"Seatutor" is the name given to the seaplane version of the Avro "Tutor" used for training in the British Royal Air Force. The well-known seaplane firm of Short Brothers will exhibit a float designed and built by them for the "Seatutor." The shape has been specially developed in the Short firm's model tank at Rochester to be suitable for operation in rough water, and to have no vices, such as "porpoising." The float is planked with "Alclad."

THE BRITISH ENGINE SECTION

Quite a wide range of aero engines will be found in the Forum. Armstrong Siddeleys have a sectioned working model of their "Tiger," a 14-cylinder radial engine rated at 700 h.p. at 2,150 r.p.m. at 5,000 ft., and also a supercharged "Panther VII" engine, much the same in design as the former, but of smaller size rated at 540 h.p. at 2,100 r.p.m. at an altitude of 12,000 ft. Both these



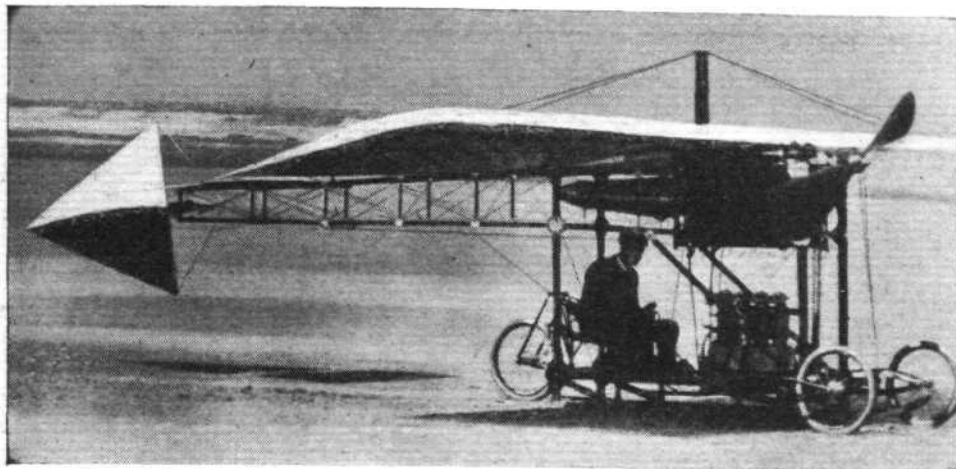
A HIGH-PERFORMANCE SINGLE-SEATER FIGHTER: The Armstrong-Whitworth "Scimitar" is available with the Siddeley "Panther" or "Tiger" engine. (*Flight Photo.*)



UNSTALLABLE: The Cierva "Autogiro" built by A. V. Roe & Co., Ltd., will be exhibited at Copenhagen, and another machine will be available at the aerodrome. The engine is a 7-cyl. Siddeley "Genet Major." (*Flight Photo.*)



NOT AN ACCIDENT: The Avro 626 is variously used for training in gunnery, bombing, photography and wireless. (*Flight Photo.*)



THE BEGINNING : The first Blackburn machine was designed, built and flown by Mr. Robert Blackburn in 1909.



FOR SIDE-BY-SIDE TRAINING : The Blackburn B.2 (Hermes IV) is of all-metal construction. (Flight Photo.) 14397



THE BLACKBURN T.S.R. : The letters stand for torpedo, spotting, reconnaissance and the engine is a Siddeley "Tiger." (Flight Photo.)



THE D.H. EXHIBIT : This will be a "Moth Major" with "Gipsy Major" engine. (Flight Photo.)

engines are fitted with reduction gearing to the airscrew hub.

Another firm which specialises in radial air-cooled engines is the Bristol Co., and on their stand will be found a sectioned "Pegasus." This is a well-known type widely used both commercially and in the Royal Air Force. It is a single row 9-cylinder radial engine of very robust design, and, according to the degree of supercharging, is rated between 550 and 665 h.p. Some idea of the wonderful workmanship in these engines will be gained from a separate display of parts which the firm is showing.

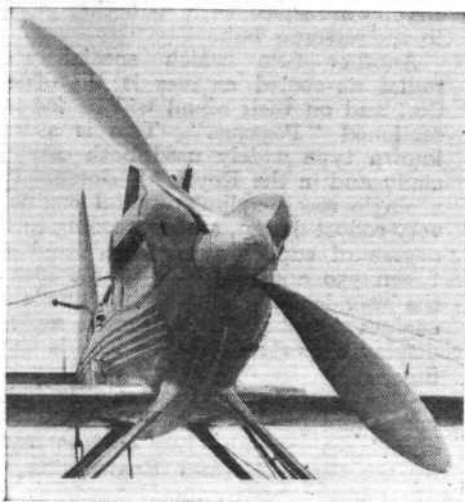
Also air-cooled but of smaller horsepower and primarily used for light civil aeroplanes, are the two engines shown by the Cirrus Hermes Engineering Co. Their larger model, the Hermes IV, is a 4-cylinder inline air-cooled inverted engine of 120-130 h.p., and will be fitted with the Caple electric inertia starter. The other engine is the Hermes II, similar in many respects to the former, except that it is an upright engine and carries its lubricating oil in a crankcase sump. It is rated at 110-120 h.p. It is often said that the forerunner of these types, the Cirrus I, was the engine which made private flying possible.

Original Design

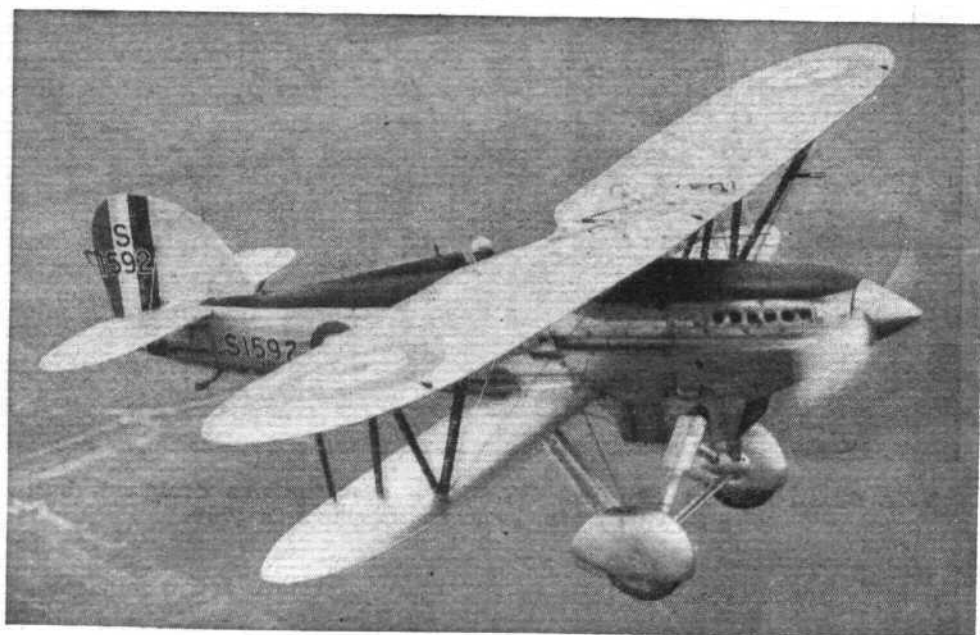
An engine which caused great interest when first shown in public at the display held at Hendon last month, by the Society of British Aircraft Constructors, was the Napier-Halford "Dagger." This is an entirely revolutionary design, being a 24-cylinder air-cooled engine built on the "H" principle with four banks of 6-cylinders each, two of which are upright and two inverted. Two crankshafts are used with the airscrew hub geared between them. In its present form, it has an output of 705 h.p. at an altitude of 12,000 ft. for a dry weight of 1,280 lb. Another engine of similar design will also be shown by Napier and Sons, and this is the "Rapier II." It is a smaller engine, having only 16 cylinders, the power output being 305 h.p. at 10,000 ft. Both these engines are high speed types, the maximum r.p.m. of the "Dagger" being in the neighbourhood of 4,000.

The Schneider Engine

Rolls-Royce engines are widely known and used all over the world, particularly for Service use where a very high performance is required. It was, of course, the magnificent power output of Rolls-Royce engines which enabled Great Britain finally to win the Schneider Trophy, and one of the actual Schneider engines will be seen on their stand. The other engine is the "Kestrel VI," a somewhat smaller engine than the Schneider model with a rated h.p. of 600 at 2,500 r.p.m. at 11,000 ft. Both engines are essentially the same, having 12 water-cooled cylinders arranged in two banks of 6 each in Vee form. Both are supercharged and fitted with reduction gearing. Very extensive use is made of light alloy castings in these engines, both the crankcase and the cylinder blocks being of this metal. The cylinders themselves are thin steel liners let into the block.



PITCH : A Fairey metal airscrew from the Schneider Trophy Supermarine S.6 will be shown at Copenhagen. (*Flight Photo.*)



A SINGLE-SEATER FIGHTER: The Fairey "Firefly" (Rolls-Royce "Kestrel"). (*Flight Photo.*)

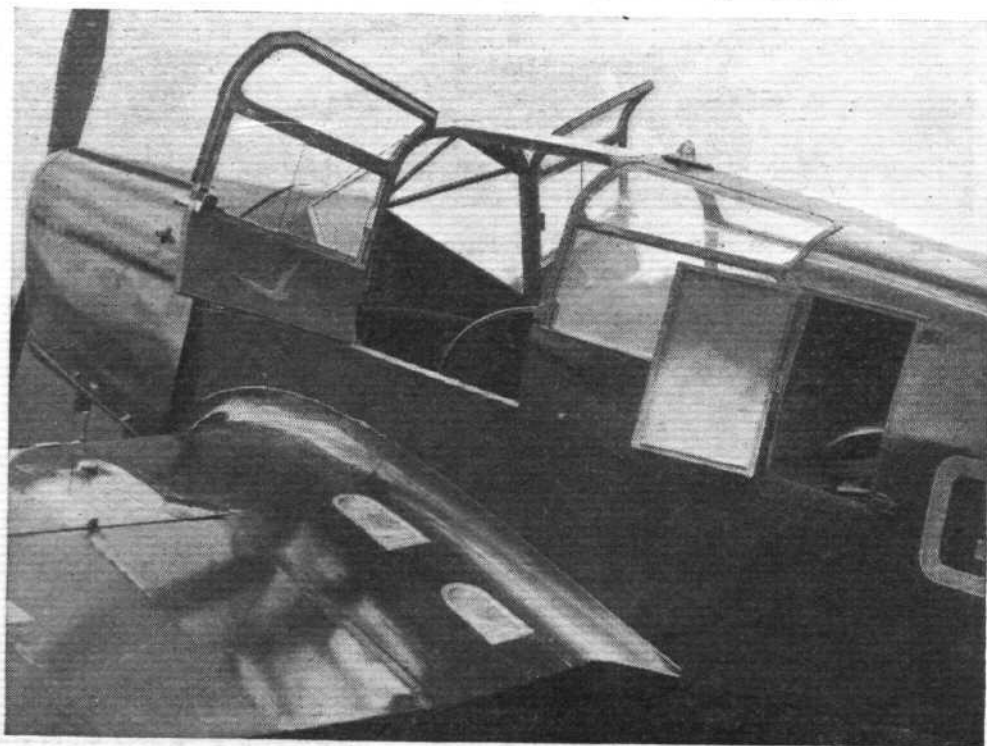
VARIOUS MATERIALS AND EQUIPMENT

Thirteen firms exhibit a wide and interesting range of accessories for aircraft at Copenhagen, so that visitors will be able to see examples of every part and material which goes to make up the intensely interesting engineering achievements known respectively as aircraft and aero engines. Finished parts like bracing wires and all those enormously varied machined parts like fork joints and turn buckles, which are made to A.G.S. specifications, will be found on the stand of Brown Bros. In aeroplanes which are fabric covered in particular, a dope has to be used on this fabric which serves the dual purpose of tautening it and of protecting it against the ravages of light and weather, and Cellon, Ltd., will be showing the various types of dope which are used. Apart from that necessary to protect the fabric, every other part of an aeroplane has to be protected against corrosion, and for this purpose cellulose and synthetic finishes are also used. One of the most important parts of an aeroplane, which is often overlooked because it gives such little trouble, but which in reality has a strenuous job to perform, is the undercarriage, and as with motor cars, it is pneumatic tyres which have helped to solve the problem involved. Both the Dunlop and Palmer tyre firms are showing wide ranges of all kinds of covers and inner tubes suitable for aeroplanes, and both will, in addition, be exhibiting the many forms of especially light but strong wheels, which together with the tyres serve to carry the aeroplane when on the ground. Of recent years, the use of wheel brakes has become standard practice, various types of which will also be shown on the stands of these firms.

Light alloys are, of course, widely used in the construction of both aeroplanes and aero engines, and examples of the type of castings which can be made in this material will be found in the exhibit prepared by High Duty Alloys, Ltd. Aero engines have to work under considerably more difficult circumstances than do internal combustion

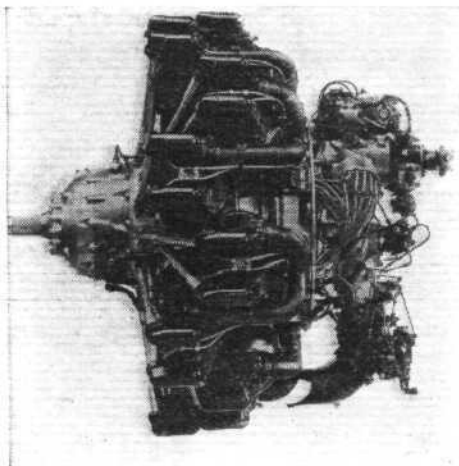


THE FAIREY "FOX" : A two-seater day bomber reconnaissance type, with Rolls-Royce "Kestrel" engine. (*Flight Photo.*)

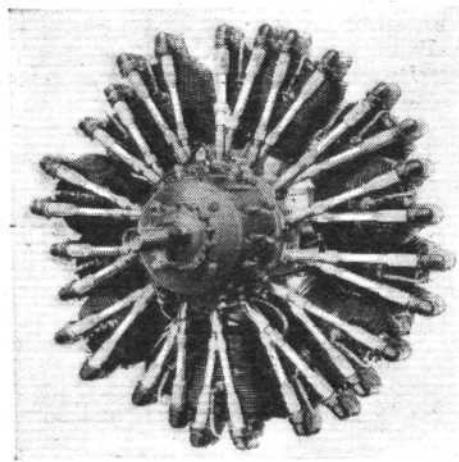


FOR FAST TOURING : The Percival "Gull," latest model, is available for demonstrations with the "Gipsy Six" engine. (*Flight Photo.*)

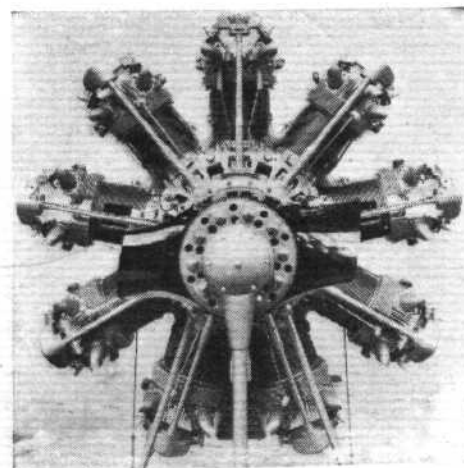
engines on the ground, and in the higher altitudes there has to be a considerable difference in the mixture to keep the engine running smoothly and giving its best power. Carburettors are, therefore, an extremely important part of the engine. H. M. Hobson will be showing their many forms of Claudel Hobson carburettors, particularly those which are fitted with the Hobson Penn automatic mixture control, a fitment



The Siddeley "Tiger IV" develops 700 h.p. at 2,150 r.p.m.



The Siddeley "Panther VII" is rated at 560 h.p. at 5,500 ft.

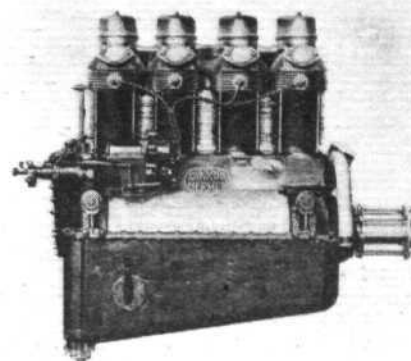


A sectioned "Pegasus" engine on exhibition at Copenhagen. The power of the different models varies from 600 to 700 h.p.

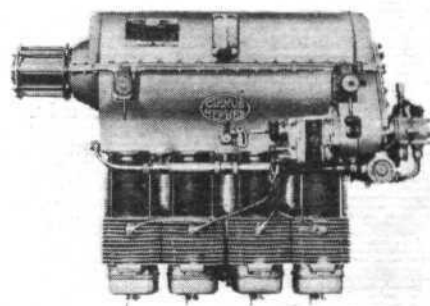
which maintains the correct mixture for all conditions and at all altitudes. Very little less important, perhaps, are sparking plugs. In some cases, these have to work satisfactorily in very hot engines and under very severe conditions, particularly when the engines are supercharged. Both the well-known firms of Lodge and K.L.G. are showing the best plugs which British industry can produce. More and more as commercial aviation becomes used by the travelling public, has it been found necessary to run air lines through weather which has hitherto been looked upon as too dangerous, but modern wireless equipment has eradicated a large proportion of this danger by enabling machines to be given their exact position from ground direction-finding stations, although the pilot in the machine may not be able to see anything on the ground at all; and also by the control officer at aerodromes being able to warn pilots and to prevent them running the risk of colliding with each other. The name of Marconi is, of course, associated with wireless in everyone's mind, so it is not surprising to find that this firm is one of the most prominent in the supply of apparatus for use in the air and on aerodromes. Apart from various forms of transmitting and receiving sets, like that used by Imperial Airways, there are also other interesting devices for especial purposes, one of which, the Marconi Homing device, has been described at length in our pages. (November 30, 1933.)

Another form of equipment which has helped to make running air lines a commercial proposition, is that installation which enables machines to be flown safely at night. Rotax will, in this connection, be showing the various kinds of navigation lamps, switch boxes, etc. The same firm also produces magnetos, and a particularly neat electric starter motor by means of which it is possible to start the engines from the cockpit, by pressing a button, thus doing away with swinging the airscrew by hand. Pilots when flying in fog or under conditions when they cannot see the ground, receive a great deal of help, as we have already mentioned, from wireless equipment, but they have also to have quite a number of instruments which are virtually a substitute for the horizon which they cannot see. Both Smith's Aircraft Instruments and Short & Mason are exhibiting not only instruments for this purpose but also all those which tell the pilot exactly what his engines are doing as well. The former firm is also showing a variety of equipment for supplying oxygen to the pilot in military aircraft when flying at very high altitudes.

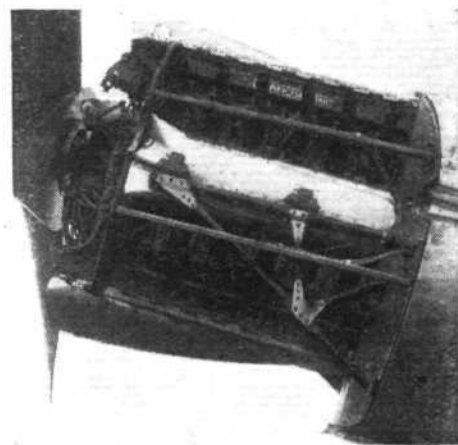
Vickers display consists of fittings for oil, fuel and water systems, and also specimens of their wheel brakes and oleo compression struts for undercarriages. In *Flight* for May 17 last, we described a new camera gun produced by the Williamson Manufacturing Co. This will be shown in the exhibition both made up to resemble a Lewis gun, so that it can be used on the standard gun ring by the observer, and also designed to be fixed to the wing of an aeroplane when used in single seater fighters or those aircraft which have fixed guns firing through the airscrew. The same company also makes Eagle aircraft cameras with which the Danish Royal Air Force is equipped.



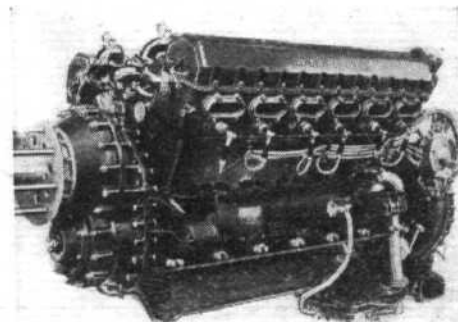
The Cirrus-Hermes II is rated at 110 h.p.



The Cirrus-Hermes inverted engine develops 120 h.p.



24 Cylinders: The Napier "Dagger" has its cylinders arranged in four banks of 6 each. It develops 675-700 h.p.



The Rolls-Royce "Kestrel VI" is rated at 600 h.p. at 2,500 r.p.m. and 11,000 ft.

MODELS

A Section, Appearing Each Month, Devoted to the Progress and Development of Model Aeronautics.

A MODEL'S 2½-HOUR FLIGHT

A remarkable unofficial record flight by a petrol-engined model aeroplane is described in our American contemporary *Model Aeroplane News*. The flight was accomplished on May 28 last by Mr. Maxwell Bassett's model, when it remained in the air for two hours thirty-five minutes, during which time it made a straight-line flight of 54 miles from Central Airport, Camden, N.J., to Armstrong's Corner, Delaware. Actually, the model travelled about 180 miles, and the greatest altitude reached was 8,000 ft. The model was timed by Mr. Victor Fritz and Capt. Jack Byrne, who followed it in a Fairchild aeroplane. Unfortunately, this flight cannot be accepted by the Contest Committee as an official record, as the present rules for petrol-engined models limit the amount of fuel that may be carried. However, as it was timed by N.A.A. officials it is worthy of being considered the unofficial world record for models of its class.

A BRITISH DURATION FLIGHT

A model belonging to Mr. A. E. Morrod, of the Warwickshire Model Aeroplane Club, accomplished a remarkable flight last month at Warwick Racecourse. When launched, the *Dragon* ascended in three spirals to a considerable height, and after the motor had run out (in about sixty seconds), air currents apparently took matters in hand until the model became a mere speck in the sky, heading for Hatton. It was in view for 10 minutes 42 seconds.

FORTHCOMING EVENTS

Several interesting model events are fixed for the immediate future. Most important of these, perhaps, is the Sir John Shelley contest for power-driven models, which will be held at Fairey's Great West Aerodrome on Sunday, August 26. Great things are expected at this meeting, for we think the power-driven model has developed considerably since last year, and certainly since the Stanger and Groves period of ten years ago. Groves, by the way, has come to life again, so

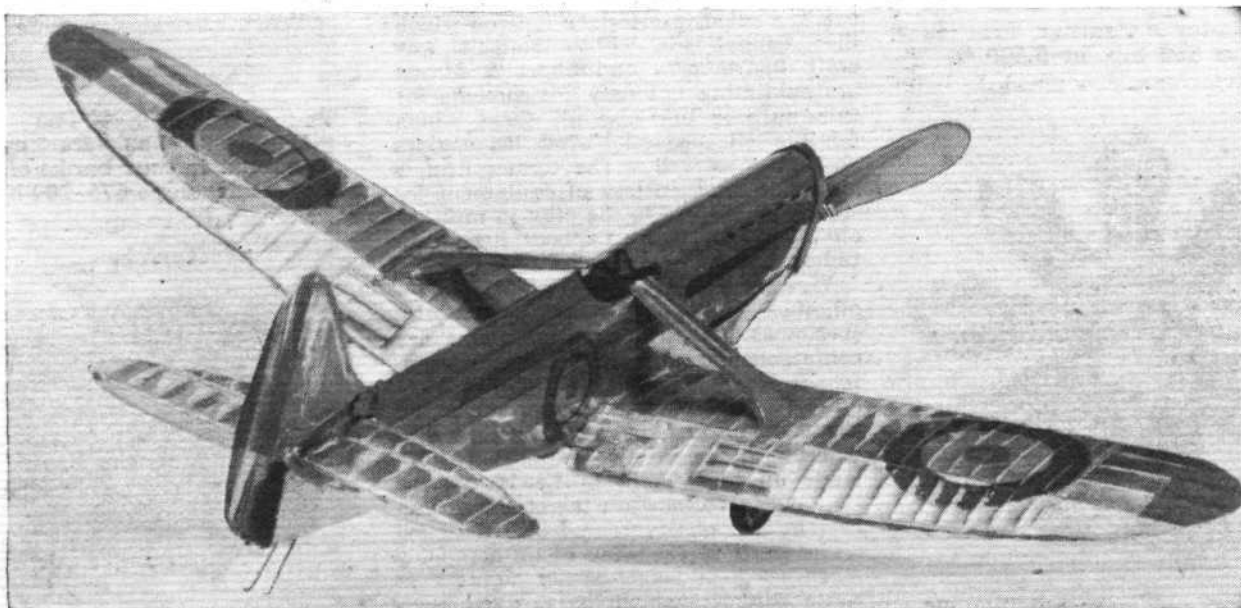


THE WAKEFIELD INTERNATIONAL COMPETITION, 1934: Members of the British Team who took part in this event (See *Flight*, June 28). From left to right (standing): R. A. White (T.M.A.C.); W. P. Fillingham (Nottingham); R. T. Howse (Bristol); A. H. Liggitt (T.M.A.C.). (Kneeling): J. B. Allman (Leamington and Warwick, Winner of Trophy); and T. H. Ives (S.M.A.E.).

something startling in the steam line may be expected soon. Another event worth watching should be the seaplane contest for the Lady Shelley Cup at Danson Park, Bexley Heath, Saturday, September 15.

T.M.A.C. AT HURLINGHAM

For the second year in succession members of the Model Aircraft Club have given a display at the Hurlingham Club. Some seventeen models took part, proceedings opening with a "Fly Past." A demonstration followed of more realistic types, including Mr. Jope's twin-motored low-wing. After this came a demonstration of parachute dropping, and finally a display of aerobatics.



MODEL METAL CONSTRUCTION: Mr. W. Rigby's latest: an all-metal version of his well-known paper "Swallow," to which we have referred on several occasions. It is only a shade heavier than the paper model, but has an equally good performance. (*Flight* Photo.)

AIR TOURING CARDS

IN *Flight* for May 24, 1934, it was announced that the Air Touring Departments of the R.Ae.C. and A.A. had come to an arrangement whereby co-operation on their part would result in better facilities being provided for air tourists. One of the facilities named was an Air Touring Card, and this week a pamphlet is being issued to which the holders of these cards will be entitled. These cards are available for an annual fee of £1 1s. to members of the R.Ae.C. and the clubs affiliated thereto, and to full car members of the A.A.

The number of restrictions and regulations relating to International air touring is already bewilderingly large, and through the medium of these Air Touring Cards a very large amount of the burden of these restrictions will be removed from the air tourist. The R.Ae.C. and the A.A. deal with all matters concerning the issue of Carnets de Passages en Douanes simplifying Customs formalities, and also obtain permits for pilots to fly over territories normally closed to aircraft.


The touring departments of these bodies can also assist air tourists with the selection of suitable routes, and the holders of Air Touring Cards can obtain from them the latest information concerning the conditions of all aerodromes on any proposed routes. Similarly, the R.Ae.C. and A.A. have available a large amount of data about the weather conditions in various countries.

Yet another way in which air tourists are assisted is by the supply of maps. A large library of air route and general flying maps is kept, which enables card holders to hire maps for all the most popular air routes. These maps are constantly kept up to date, and may, therefore, be relied upon implicitly.

We have many times had occasion to refer to the Register of Landing Grounds, in which particulars are given of landing grounds suitable for use by aircraft, but which are not necessarily licensed by the Air Ministry. The aerodromes listed in this Register are all inspected at frequent intervals, and, should any of them become unfit for use, amendment sheets are immediately issued to the holders of the Register. The R.Ae.C. and A.A. also give advice on the selection of aerodrome sites, and for this purpose are continually in contact with local authorities throughout the country.

Information bulletins are issued from time to time by the touring departments of these bodies, and in particular always include information about the facilities for flying to and landing near the major sporting events, like the Grand National and the Le Mans motor races; and also information is given about the flying meetings which are organised from time to time by aero clubs of other countries.

Obviously, it is in the interests of everyone who uses



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VALID UNTIL DECEMBER 31ST 1935

This card entitles the holder to the
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AIR TOURING CARD NO.

Please quote this number in all communications
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Usual signature of holder

Issued on _____

193 _____

Serial No. **1**

The new Air Touring Card

the air to assist and encourage others to do likewise, and the R.Ae.C. and A.A. are anxious to do all in their power to increase and improve the facilities provided for them, therefore we strongly recommend everyone who becomes an air tourist to join and subscribe for an Air Touring Card.

The address of the R.Ae.C. is 119, Piccadilly, London, W.1 (Grosvenor 1246); and the A.A., Fanum House, New Coventry Street, London, W.1 (Whitehall 1200). Particulars of these organisations can also be obtained from the touring offices at Heston Airport in England, and at Almaza Airport in Cairo.

THE INDUSTRY

A UNIVERSAL JOINT

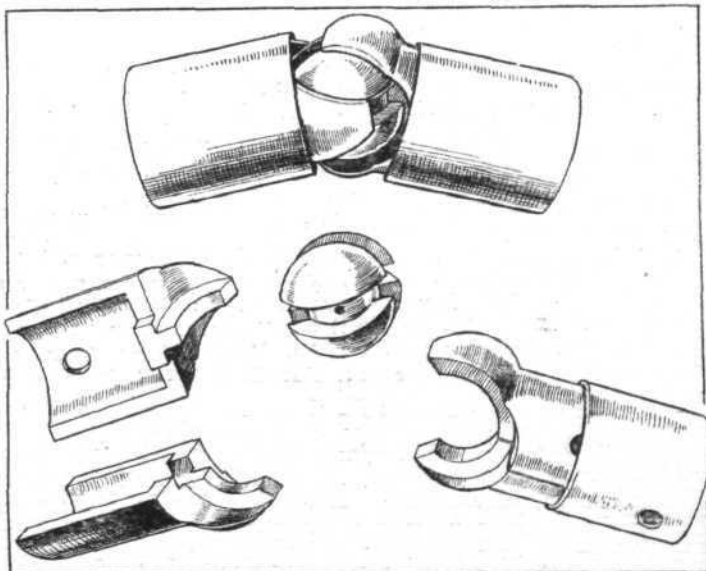
WHILE manufacturing parts for the rotor head and drive of the Autogiro, Mr. A. J. Mollart and Mr. J. C. Hendra, of the Mollart Engineering Co., of Thames Ditton, evolved a new form of universal joint, which entirely eradicates the troubles previously experienced with universal joints utilising a ball and claws.

There are two universal joints in the shaft drive by which the engine is used to give the rotor in an Autogiro its initial revolutions, and during trials it was found that the form of joint used gave trouble. The Mollart Engineering Co., therefore, produced the M.E. Universal Joint, as it is known.

As can be seen from our sketch, the joint consists of a steel ball with two deep grooves, case hardened and ground at right angles to each other. Working in these grooves are two pairs of curved tongues, each pair of which is locked together either by a sleeve, as shown in our sketch, or by a screwed collar, according to the working for which the joint is intended. Each pair of tongues encircles the ball for an arc of over 250 degrees, therefore the joint will stand a considerable amount, both in tension and compression.

The results in this direction obtained during an official test at the National Physical Laboratory were quite unusually satisfactory.

These joints are made up in nine sizes, running from a

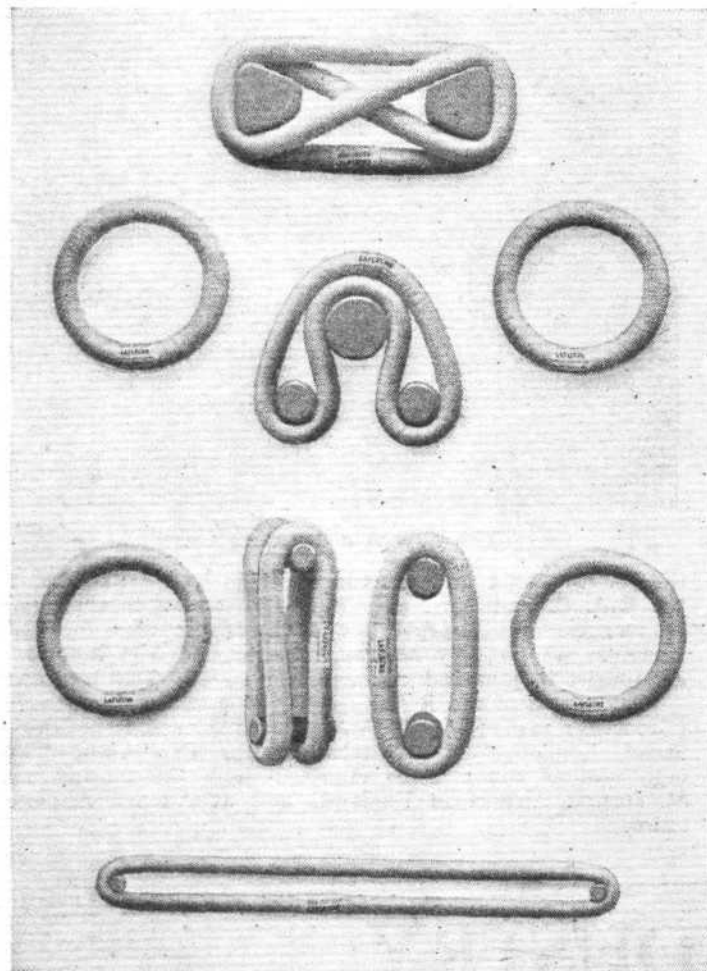


The M.E. Universal Joint in detail

$\frac{1}{2}$ in. ball to one of $2\frac{1}{2}$ in., and naturally have a very wide application in all other fields of engineering, apart from the work for which they are being so successfully used in the Autogiro. For example, they have already been applied to multi-spindle drilling machines, as used by one of our largest motor car manufacturers, for drilling the holes in a cylinder block in one operation. Previous joints having given a lot of trouble, the M.E. was tried, and its life was immeasurably greater than the others.

THE TURNER RING

RUBBER is the only known material which has the natural property of absorbing energy. The "Turner Ring" is a convenient and efficient form of braided rubber shock absorber which is used on several well-known types of aircraft, although there seems to be an impression these days that this type of shock absorber is but a relic of the early days of flying.



Various examples of Turner Shock Absorber Rings.

Two types of ring are made, one to carry tensile loads and the other to take compression loads. Both are made of the best Para rubber thread $\frac{1}{16}$ " square. The accompanying illustration shows various applications of these rings to shock absorbers.

Among other purposes, the "Turner Ring" is now being employed to operate levers and in the construction of flexible couplings for the transmission of power.

These rings are manufactured by Luke Turner and Co., Ltd., Deacon Street, Leicester, the London representative being Industrial Rubber Manufacturers, Ltd., 191, Tottenham Court Road, W.1. On the Continent the "Turner Ring" is manufactured by La Fleche Freres, 69, Rue Réamur, Paris, and Villard Doron Fils et Cie, 13, Rue Berthelot, Saint Etienne.

HUNDREDS OF TAIL WHEELS

FROM very modest beginnings Mr. G. H. Dowty has gradually built up a very flourishing business at Grosvenor Place South, Cheltenham. We need hardly remind our readers that many years ago Mr. Dowty began to specialise in the design of aircraft undercarriages, and when he established his firm under the title Aircraft Components, Ltd., he began by introducing an ingenious telescopic "leg," the out-

standing feature of which was that coil springs, although placed end to end, worked in parallel. The result was a telescopic tube of very small overall diameter and low air drag. Since those early days Mr. Dowty has brought out improvements from time to time, and no better proof of the esteem in which his undercarriage "legs" are held could be found than the fact that it is now quite a common saying among flying people: "Oh, you just pull the stick back and trust in Mr. Dowty."

Apart from telescopic struts, Mr. Dowty has produced internally sprung main wheels, which can be carried on cantilever struts and thus save drag. Tail wheels of various types have also been produced, and it is interesting to record that no less than nineteen squadrons of the R.A.F. are having, or have had, their "Bulldogs" fitted with Dowty tail wheels. The same type of tail wheel is fitted as standard on the Gloster "Gauntlet" and the Hawker "Demon."

With so many aircraft designers turning their attention to retractable undercarriages, we shall not be surprised to hear at any moment that Mr. Dowty has brought out a "retractable leg."

TECHNICAL SERVICE

FLT. LT. N. COMPER and Mr. F. R. Walker, who have now severed their connection with the Comper Aircraft Co., are starting an aviation business for which there should be a considerable demand. They intend to establish an office from which they will give technical advice to those who want it about aeroplanes and matters connected with flying. A prospective purchaser will be able to get from them sound advice about the aeroplanes which will best suit his specific work, and will thereby be saved the expense of experimentation and needless consultations with manufacturers who have not got suitable machines.

INSURANCE FOR THE MELBOURNE RACE

Last week we referred to an insurance pool which was being formed to carry the risk for those taking part in the England-Australia Race. The position is now clarified, and we learn that F. W. Jones and Partners, of Croydon, Surrey, are the brokers who are, so to speak, responsible for the scheme. The participants in the pool, which is in no sense a monopoly, are all those interests which normally carry aviation risks, and include both the outside companies and Lloyds Underwriters. The essence of the scheme would appear to be based on the obvious fact that it is easier to quote cheaper rates for the pilots in a race like this if the majority of the business is shared by one pool. Without such a pool it is doubtful whether individual underwriters would consider the risk one which they themselves could carry.

NEW COMPANIES

COMMERCIAL AIR HIRE, LTD. Capital £500 in £1 shares. Objects: To establish, maintain, work and carry on lines of aerial communication by means of aeroplanes, seaplanes, flying boats, airships and other aerial conveyances, between London and Paris, etc. The subscribers (each with one share) are: Rose Roth, 39, The Vale, Golders Green, N.W.11, solicitor's clerk. Lilla Walsh, 85, Ferndale Rd., Woodside, S.E.25, solicitor's clerk. The first directors are to be appointed by the subscribers. Solicitors: Kenneth Brown, Baker, Baker, Essex House, Essex St., W.C.2.

INCREASE OF CAPITAL

PHILLIPS & POWIS AIRCRAFT (READING), LTD. (Reading Aerodrome, Woodley, Berks). The nominal capital has been increased by the addition of £10,000 beyond the registered capital of £15,000. The additional capital is divided into 5,000 6 per cent. preference and 5,000 ordinary shares of £1 each.

PUBLICATIONS RECEIVED

Résumé of Commercial Information. Series 5. No. 9. February-May, 1934. Compiled by the Directorate of Civil Aviation (C.A.5). London: Air Ministry, Kingsway, W.C.2.

AERONAUTICAL PATENT SPECIFICATIONS

Abbreviations: Cyl. = cylinder; i.c. = internal combustion; m. = motors. (The numbers in brackets are those under which the Specification will be printed and abridged, etc.)

APPLIED FOR IN 1932

Published August 16, 1934.

23161. G. H. REID. Gyroscopic indicators for use with aircraft. (413,715.)

APPLIED FOR IN 1933

Published August 16, 1934.

3674. C. FROBISHER. Airport landing-grounds. (413,773.)

24975. SIEMENS AND HALSKE AKT.-GES. Two-stroke internal-combustion aircraft engine having scavenging and supercharging. (413,891.)

34266. W. H. WOOD. Auxiliary lifting means for aeroplanes. (413,948.)

APPLIED FOR IN 1934

Published August 16, 1934.

56. M. BIRKIGT. Firearms for use on aircraft. (413,968.)

1563. L.P.R. Co. Aircraft. (413,662.)

4918. DORNIER-METALLBAUTEN GES. AND C. DORNIER. Handplanes. (413,993.)